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THE

VERTEBRATE ZOOLOGY OF SIND.

A SYSTEMATIC ACCOUNT,

55317

WITH DESCRIPTIONS OF ALL THE KNOWN SPECIES OF MAMMALS, BIRDS, AND REPTILES INHABITING THE PROVINCE;
OBSERVATIONS ON THEIR HABITS, &c.;
TABLES OF THEIR GEOGRAPHICAL DISTRIBUTION IN PERSIA, BELOOCHISTAN, AND AFGHANISTAN; PUNJAB, NORTH-WEST PROVINCES, AND THE PENINSULA OF INDIA GENERALLY,

WITH

WOODCUTS, LITHOGRAPHS, AND COLOURED ILLUSTRATIONS.

BY

JAMES A. MURRAY,

CURATOR, KURRACHEE MUNICIPAL MUSEUM; AUTHOR OF A "HAND-BOOK TO THE GEOLOGY, BOTANY, AND ZOOLOGY OF SIND;" "THE PLANTS AND DRUGS OF SIND;" "KURRACHEE TO KANDAHAR," &c.

7X-9 2

LONDON:—RICHARDSON & Co., 13 PALL MALL.
BOMBAY:—EDUCATION SOCIETY'S PRESS, BYCULLA.

1884.

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BOMBAY:

PRINTED AT THE EDUCATION SOCIETY'S PRESS, BYCULLA.

TO

JAMES STRACHAN, Esq., M.I.C.E.,

ENGINEER AND SECRETARY, KURRACHEE MUNICIPALITY,

TO WHOSE UNVARYING INTEREST

IN THE ZOOLOGY OF THIS PROVINCE,

MANIFESTED DURING THE LAST DECADE

AS VICE-PRESIDENT AND MEMBER OF THE COMMITTEE

OF MANAGEMENT OF THE KURRACHEE MUSEUM,

IS GREATLY DUE

THE DEVELOPMENT OF THE COLLECTION IN THAT INSTITUTION,

THIS ATTEMPT

TO MAKE THE STUDY OF THE ZOOLOGY OF SIND

MORE POPULAR AND TO HELP FURTHER DISCOVERIES,

IS GRATEFULLY DEDICATED BY

THE AUTHOR.

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ERRATUM.

Stenodactylus Dunstervillei, p. 363, stands as *S. Orientalis.*

Since this has been in print the specimen representing this species has been carefully compared with the type specimen of *S. Orientalis* in the Indian Museum, Calcutta, by Dr. J. Anderson, who determines it to be that species.

ROYAL ASIATIC SOCIETY LIBRARY OF THE BOMBAY BRANCH OF THE

PREFACE.

In publishing this work I fulfil the promise held out in my handbook to the Geology, Botany, and Zoology of Sind, of issuing in due course a series of volumes descriptive of the flora and fauna of Sind. In 1881 the "Plants and Drugs," of the Province was published. This, besides being largely patronized, has been productive of good results, inasmuch, as affording aid to collectors, several collections have been brought together of the Sind plants, as well as of those of Beloochistan and the shores of the Persian Gulf, a knowledge of the flora of which latter countries was hitherto very limited. The importance, too, of the subject may well be estimated by the calls from America, Continental Europe, and Museums in India for supplies of the indigenous drugs.

The present work will, it is hoped, be found as useful a manual of the four vertebrate classes, viz., Mammals, Birds, Reptiles, and Amphibians of Sind, as well as of the Punjab, N.-W. Provinces, Beloochistan, Persia and the Western Presidency generally, in so far as the animals inhabiting these parts are identical with those of Sind; especially to those interested enquirers to whom hitherto a descriptive manual was a desideratum, and to others who find delightful employment or enjoyment in their leisure hours in attempting to elucidate from personal observations the various branches of natural history. It is purely intended as a means to the acquirement of a better knowledge of the fauna of the Province, by recording what is already known. There is no other British possession in India which, in this respect, is so far behind as Sind. Mr. Blanford speaks of this fact in a pamphlet circulated in 1875, and, as he says, "it is really not creditable to us to be obliged to confess that, after Sind has been British territory for thirty-two years, (more now) we actually know less of the animals inhabiting it than the Russians have already ascertained in the case of their newly-acquired Province of Turkistan."

It is only very recently that any attempt has been made towards contributing to a knowledge of the Sind fauna. Among the first of the naturalists to whom science owes much, may be named Mr. W. T. Blanford, whose contributions from time to time in various scientific journals have helped to a general knowledge of the mammals and reptiles inhabting the Province. To Mr. A. O. Hume, C.B., we are indebted for a knowledge of the avi-fauna, his chief and largest contribution having appeared in the first volume of the periodical entitled, "*Stray Feathers,*" launched by him in 1872. Captain Butler, Mr. H. E. James, Colonel LeMesurier, Mr. S. B. Doig, Lieutenant Barnes, myself, and others following up the interest in the subject, contributed subsequently to a more complete knowledge, the number of known species being now 399. But notwithstanding these researches, Sind cannot be said to be thoroughly explored, to do which with any degree of success is a task of no small difficulty, and requires the co-operation of enquirers and interested persons.

The materials for this work have been mainly derived (1st) from collections made by myself during a thirteen years' residence in Sind, and during occasional tours in the Concan, Deccan, Central and South India, the Punjab, N.-W. Provinces, and Southern Afghanistan. Next, are the different works treating of these four vertebrate classes, as well as the various important contributions to a knowledge of the local fauna of many parts of India in the volumes of the *London Zoological Society's Journal, Annals and Magazines of Natural History, Journal of the Asiatic Society of Bengal, Ibis, Stray Feathers,* and other scientific periodicals.

Descriptions are given of all the Sind vertebrates—except fish—known to science. In every instance where a sufficiently satisfactory series of specimens was not available to me for description, and where the animal had already been so fully described as to leave nothing to be desired, I have preferred to give the original descriptions. These are chiefly from Dobson's excellent monograph of the *Chieroptera;* Oldham Thomas' monograph of the Indian species of *Mus;* Sharpe and Seebohm's monographs of birds in the collection of the British Museum (vols. 1 to 6); Gunther's most valuable work on the

reptiles of British India, which, it is to be hoped, will soon be re-published with additions; Blanford's *Zoology of Eastern Persia*, which has been of special value; Theobald's *Reptiles of India*; Hume's *Stray Feathers*, and the valuable papers contributed from time to time to the *Journal of the Asiatic Society of Bengal* by Dr. J. Anderson, Superintendent of the Indian Museum at Calcutta. It will, therefore, be understood that this work is chiefly a compilation.

To facilitate the identification of animals, diagrams are given, illustrating the different parts of birds and reptiles, with the corresponding terms used in their description. These, it is hoped, will be found useful to collectors, students, and would-be enquirers.

The scientific and trivial English names of each species is given; the different synonyms by which it is known; an account of its habits, resorts, and distribution, and its name in the vernacular. In the case of reptiles, besides their description, range, &c., diagrams are given showing the dentition of venomous and non-venomous species, and the nature of the punctures that would be made by their bites. The symptoms of the action of their poison, and the treatment to be followed in all cases of wounds caused by them are also detailed.

For the sportsman woodcuts of most of the game birds are added.

Tables of the distribution of the animals of Sind are also appended, the range or geographical limits being, on one side, to Beloochistan, Persia and Afghanistan, and on the other, throughout India, including the Punjab, N. W. Provinces, Oudh, Bengal, Burmah, the Western Coast, Rajputana, Southern and Central India, the Concans and Deccan.

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INTRODUCTION.

An arid country like Sind, with an extra-tropical climate, a scanty rain-fall, and temperature during the hot months ranging from 95 to 102° Fahr., allow of only a comparatively moderate flora, and necessarily a fauna less abundant, than in more moist climates, where the mean average rain-fall—a potential factor in the distribution of vegetable and animal life—is above 40 inches.

In some respects the fauna of Sind differs widely from that of other parts of India, having members of an Indo-African character, which do not extend far to the south or east of the Province, while animals peculiar to heavy forest lands are practically absent. On the other hand, owing to the remarkable similarity of climate, and nearly the same average rain-fall, the fauna is almost identical with that of the Punjab, N. W. Provinces, Beloochistan, the shores of the Persian Gulf, Rajputana, and parts of the Western Presidency, south of Sind. A glance at the distribution table (pp. 402-404) will sufficiently prove this. Of the 73 mammals known to inhabit Sind, 20 belong to the order *Chieroptera*, 4 to the *Insectivora*, 20 to the *Carnivora*, 4 *Cetacea*, 15 *Rodentia*, 9 *Ungulata*, and 1 to the *Edentata*. Six of these occur only to the westward; 12 are found both west and northwards, extending into the Punjab, N. W. Provinces and Bengal. Those extending northwards are *Vesperugo serotinus et maurus*, *Scotophilus pallidus* (not beyond the Punjab), *Erinaceus jerdonii* (not beyond the Punjab), *Herpestes persicus*, *Vulpes pusillus*, *Nesokia Hardwickii*, *Mus bactrianus et alexandrinus*, *Capra ægagrus* and *Ovis cycloceros*; 19 extend to Afghanistan; 22 do not occur east or south of the Province; 5 are peculiar to it, and the rest are generally distributed. The forms characteristic of the Persian fauna are *Felis chaus*, *Gerbillus erythrourus*,* *et indicus*,* *Lepus craspedotis*,* *Mus bactrianus*,* *Ovis cycloceros*,* *Capra ægagrus*,* *Herpestes persicus** and *Phyllorhina tridens*. These do not occur to the south, nor to the east of Sind, but those marked with an asterisk, with a few others, as *Cynonicteris amplexicaudata*, *Pipistrellus leucotis*, *Sciurus palmarum*, *Nesokia Hardwickii*, *Vesperugo abramus et maurus* and *Felis caracal* occur also in Beloochistan and along the shores of the Persian Gulf. A better idea of their distribution will be gained by reference to the table at pp. 402-404.

It is to be regretted that the fauna of Afghanistan, and the interior of Beloochistan, have not been as fully worked out as that of Persia; all the available information have, however, been utilized.

The following shows the distribution of the 73 mammals of Sind. The information has been collected with the greatest ascertainable accuracy, from materials at hand :—

Sind	73
Beloochistan	29
Persia	25.
Afghanistan	17*
Punjab	51
N. W. Provinces	47
Oudh	41*
Bengal	40
Rajputana	35
Central India	33
Kutch	44
Guzerat	33*
Concan	35*
Deccan	38*
South India	36*

Although the mammalian fauna is small, owing to the paucity of natural forests and covert yielding vegetation, yet the marshes, the plains, deserts, valleys, the rivers, forests and hills have each their peculiar inhabitants. The Hog-deer and Wild Boar affect the acacia-lined banks of the Indus and the thick tamarisk-fringed delta, the Gangetic Porpoise and the Otter sport in the Indus, the Civet Cat roams along the edges of the marshes, the Gazelle on the plains adjacent to or below the hills, while some of the most inaccessible parts of the mountainous regions claim the Ibex (*Capra ægagrus*), the Gud (*Ovis cycloceros*) and the Bear (*Ursus Thibetanus*), and the domed tombs, (a peculiar feature in Sind) untenanted buildings, vaulted caverns and similar retreats afford shelter to the *Chieroptera*, which, in number of species, equals that of the carnivorous order.

Aves.—Not unlike the indigenous flora the character of the avi-fauna of Sind shows a marked analogy to that of Persia, Arabia and N. E. Africa. European forms also occur, and these are generally all the Waders, as Storks, Herons, Snipe and Curlews, as well as Geese and Ducks, of which there are numerous species and vast number of individual members of each, chiefly migrants which arrive and stay during

* Imperfectly known.

winter, and leave the Province at tolerably fixed periods during the months of March, April and May. The whole net work of channels, mud banks and marshes at the mouth of the Indus, the lakes or dhunds formed by the periodical inundations of the river, as well as the sea coast, literally teem from about the middle of September to the beginning of June, with almost every form of bird-life affecting such situations, from the unwieldy Pelican to the little Snippets, which run along the ripple-marked sands of the sea coast.

There is abundance of shooting during this period in all the lakes and their neighbourhood. Wild Fowl literally swarm, especially on the Munchur, where they are in thousands and myriads, their compact masses forming, as it were, living islands upon the water, and, when disturbed, a feathered cloud in the air. Flamingoes, Geese and Ducks too are quite as numerous.

With these come some of the rapacious order, also winter visitants, whose movements are necessarily connected with those upon which they prey. Again there are the smaller birds which keep along the scrub or tamarisk jungle fringing the banks of the Indus and the edges of lakes, as the *Sylviinæ* and *Phylloscopinæ* families. Neither songsters nor gallinaceous birds are numerous in regard to species, though abundantly so as to individuals; among the latter are Grouse, Patridges, Quails, the Houbara Bustard, Floriken, and several other resident species. The *Sylviinæ* and *Saxicolinæ* families too are prominent visitors during winter, and are fairly well represented. Among the great multitude of birds, regularly visiting us, are a few stragglers which make their way to the Province in excessively cold winters. These are *Ruticilla mesoleuca*, *Lanius auriculatus*, *Saxicola leucomela*, *Emberiza miliaria*, *Linaria cannabina*, and *Cygnus olor* (*Murray, Additions to the Sind Avi-Fauna, S. F.* vol. vii. pp. 108-123) which, although not properly belonging to the fauna, the circumstance of their having occurred during an extremely severe winter in 1878, is worthy of record, since Sind has nearly as many Palæarctic as oriental species. The following gives the distribution of the total number (399) of birds found in the Province:—

257	are found in	Beloochistan.	266	are found in	Rajputana.
240	,, ,, ,,	Persia.	235	,, ,, ,,	Central India.
210	,, ,, ,,	Afghanistan.	265	,, ,, ,,	Kutch.
320	,, ,, ,,	Punjab.	283	,, ,, ,,	Guzerat.
308	,, ,, ,,	N. W. Provinces.	237	,, ,, ,,	Concan.
279	,, ,, ,,	Oudh.	244	,, ,, ,,	Deccan.
262	,, ,, ,,	Bengal.	281	,, ,, ,,	S. India.

A few of those characteristic of the Persian fauna or belonging to the Palæarctic region are *Ædon familiaris, Bucanetes githagineus, Emberiza huttoni, Melanocorypha bimaculata, Corvus umbrinus, Alcedo ispida, Hypocolius ampelinus, Oriolus galbula, Saxicola albonigra* et *morio, Hypolais obsoleta, Garrulus atricapillus, Certhilauda desertorum, Pterocles lichtensteinii* et *coronata, Puffinus persicus* and *Larus gelastes.*

There are also a few which extend their range north only into the Punjab, and are not found either south or east of the Province; such are *Gypaetus barbatus, Falco babylonicus, Falco œsalon, Aquila chrysaetos, Haliœtus albicilla, Merops apiaster, Coracias garrula, Picus sindianus, Saxicola leucomela, Lusciniola neglectus et melanopogon, Anthus blackistoni, Palumbus casiotis, Pterocles alchata, Caccabis chukar, Ammoperdix bonhamii* and *Vanellus vulgaris,* while those peculiar to Sind are, as far as present information extends, *Pyctoris griseigularis, Blanfordius striatulus, Phylloscopus sindianus, Passer pyrrhonotus, Serinus pectoralis* and *Podiceps nigricollis.*

Reptiles are not numerous in Sind, and if the species of *Hydrophidæ* are excluded, there are not many which are venomous. As far as they have been collected, species of all four orders occur, viz:—*Chelonia, Sauria, Ophidia* and *Amphibia,* the number of genera and species belonging to each of these being comparatively as many as occurs in other parts of India. Climatal conditions are rather favourable to these, and there are many species, especially among the *Lacertilia,* which are not only peculiar to Sind, but interesting, as being forms ranging into the Palæarctic region; others are of a wide range, and a few are peculiar to the Province; in fact, the Palæarctic and oriental genera are here intermingled. Among lizards, the genus *Psammosaurus* is a North African form; *Scincus,* a North African and Arabian, also *Seps* and *Agama;* all these occurring in the Southern Palæarctic region. Of 21 families of the *Ophidia,* represented in India, 12, or more than one-half, occur in Sind, and, except the *Crotalidæ,* all the venomous forms occur. There are as many species of Lizards as Snakes, and nearly twice as many Chelonians as there are Amphibians. The total number of species of all the different orders and families is 97; of these—

27	are	found	in	Beloochistan.	23	are	found	in	Central India.
25	,,	,,	,,	Persia.	29	,,	,,	,,	Kutch.
15	,,	,,	,,	Afghanistan.	27	,,	,,	,,	Guzerat.
46	,,	,,	,,	Punjab.	22	,,	,,	,,	Concan.
43	,,	,,	,,	N. W. Provinces.	21	,,	,,	,,	Deccan.
49	,,	,,	,,	Bengal.	37	,,	,,	,,	South India.
18	,,	,,	,,	Rajputana.					

The different orders, families, genera, and number of species of each gen represented in Sind are shown in the following table :—

Order.	*Family.*	*Genera.*	*Species.*
Chelonia or Turtles and Tortoises	Testudinidæ	2	2
	Emydidæ	3	4
	Trionycidæ	3	3
	Chelonidæ	2	2
Sauria or family of Lizards	Crocodilidæ	2	2
	Varanidæ	2	4
	Lacertidæ	3	5
	Scincidæ	7	9
	Geckotidæ	7	11
	Agamidæ	6	9
Ophidia	Typhlopidæ	1	2
	Oligodontidæ	6	10
	Homalopsidæ	1	1
	Psammophidæ	1	2
	Dipsadidæ	1	1
	Lycodontidæ	1	2
	Pythonidæ	1	1
	Erycidæ	2	2
	Elapidæ	2	2
	Hydrophidæ	3	14
	Viperidæ	2	2
Batrachia Salienta	Ranidæ	2	4
	Bufonidæ	2	3

Of these the number of species of the *Emydidæ*, *Lacertidæ*, *Geckotidæ*, and *Hydrophidæ* would on closer investigation be found at least one-third more than the present number. The genera, most widely distributed in India of the harmless Colubrine Snakes, are Typhlops, Oligodon, Cynophis, Zamenis, Tropidonotus, Cerberus, Dipsas, Lycodon, Eryx and Python. Of the last one species only, which inhabits forest lands contiguous to the limit of inundation and stony tracts covered with Euphorbia. From the month of May to October these are extremely numerous in Sind with Echis and Naja.

Of the 40 species of *Lacertidæ* in Sind, fifteen occur in Persia; seven of these, as *Mesalina pardalis, Euprepes septemtæniatus, Gongylus ocellatus, Bunopus tuberculatus, Pristurus rupestris, Trapelus rubrigularis,* and *Trapelus ruderatus*, are not found to the north, south or east of the Province; five extend their range to the Punjab and Afghanistan also, while twelve of the fifteen are also found in Beloochistan.

Of species of *Lacertilia* peculiar to Sind there are eight—such are *Ptyodactylus homolepis, Hemidactylus Gleadowii, Hemidactylus Kara-*

chiensis, Gymnodactylus petrensis, Stenodactylus orientalis et Dunsterville, Scincus arenaria and *Stellio melanura.* Among the Ophidia, *Zamenis gracilis, Hydrophis Stewartii, Hydrophis dayanus, robusta, Bishopii* and *Guntherii,* (the two last newly described species) are the only forms peculiar to Sind. The most common forms distributed in India are *Zamenis diadema, Tropidonotus quincunciatus, Echis carinata, Psammophis Leithi* and four species belonging to the family *Hydrophidæ,* which are numerous on the Sind and Beloochistan coasts; of this latter those already known are no doubt only a few which affect the seas. The majority of reptiles belong to the oriental or Indian fauna. Sind Chelonians are not known in Persia; it is not unlikely, however, that one or both marine forms will be found to occur.

In concluding this introduction it only remains for me to acknowledge the valuable assistance received in this attempt to collate the scattered information regarding the vertebrate fauna of Sind into a systematic account. Though seemingly simple, it has involved considerable labour and research, and could not be successfully accomplished without valuable aid. Among those to whom I am under special obligation I would first mention Dr. John Anderson, Superintendent of the Indian Museum, and Professor of Comparative Anatomy, Calcutta, to whom I am not only indebted for the identification of many species of which I had the smallest doubt, at a time when no works of reference were available to me for my guidance, but also for copies of descriptions of many animals from publications which were not accessible to me, and for very kindly permitting the use of the plates of the *Erinaceidæ,* which accompanied his paper in the *J. A. S. Bengal.* To these I have added a little, and the structure of the dentition of the species has been made slightly more prominent from skulls in my possession. Next I would mention Dr. Gunther, of the British Museum, to whom I am in several ways indebted. To Mr. W. T. Blanford, too, for very kindly looking over the collection of reptiles in the Museum, and setting aright, when passing through Kurrachee for the last time, some obsolete names. Among many friends who have kindly assisted me by collection of specimens I am especially indebted to Mr. F. Gleadow, Deputy Conservator of Forests, also to Mr. W. D. Cumming, of the Persian Telegraph at Bushire and Fao, whose collections from these parts have helped most materially in not only adding to the already known fauna of Persia and Mesopotamia, but in confirming the occurrence of many species of which Mr. Blanford (*East. Persia*) was in doubt, thus making this portion of the distribution table of considerable value as to the distribution of the Sind species into Palæarctic limits. To Mr. B. T. Ffinch, Director

of the Persian Gulf Telegraph, I am also under obligation, especially for information connected with the nidification of certain species, obtained by his organizing, at various periods, expeditions in search of breeding grounds in the Persian Gulf; for specimens of the rarer species, especially of *Chieroptera*, I have to tender my best thanks to Mr. J. Strachan, due to whose interest in Zoology generally, and in the Kurrachee Museum, this work has been dedicated to him. In birds my sole referee was Mr. A. O. Hume, C. B., whose valuable assistance, also his liberal presentation of a large collection of bird skins, helped me much with the distribution table. I have also to acknowledge my indebtedness to Lieut. Henry E. Barnes for a valuable collection of Central Indian Mammals and Birds which have been of special value in fixing their distribution in that part of India ; also to the several members of the Managing Committee of the Kurrachee Museum for assistance given in several ways.

Finally I have to crave the indulgence of those authors—already referred to in the Preface—and others, for the privilege I have taken of so largely adding from their valuable works to the existing knowledge of the fauna of Sind. My sole object in publishing this work is, as I have already said, to place on record what is already known of the fauna of Sind, also to occasion a greater interest in the rich mines of the treasures of science to be found in the Province, and thus bring to the surface the many valuable gems it contains.

J. A. M.

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ZOOLOGY OF SIND

CLASS, MAMMALIA.

ORDER—CHIROPTERA.

Volant mammals, with thoracic postaxillary mammæ, a simple or two-horned uterus, and smooth cerebral hemispheres not extending backwards over the cerebellum. Forelimbs specially modified for flight. The forearm consists of a rudimentary ulna, a long curved radius and a carpus of six bones supporting a thumb and four greatly elongated fingers, between which, the sides of the body and the hinder extremities, a thin expansion of the integument (*the wing membrane*) is spread out. The knee is directed backwards, owing to the rotation of the hind limb outwards by the wing membrane, a peculiar elongated cartilaginous process (*the calcaneum*) rarely rudimentary or absent, arising from the inner side of the ankle joint, is directed inwards, and supports part of the posterior margin of an accessory membrane of flight, extending from the tail or posterior extremity of the body to the hinder limbs (*the interfemoral membrane*). The dental series consists of four kinds of teeth—incisors, canines, premolars, and molars; and the dental formula never exceeds

$$\text{Inc. } \frac{4}{6},\ \text{c } \frac{1-1}{1-1},\ \text{pm. } \frac{3-3}{3-3},\ \text{m. } \frac{3-3}{3-3} = 38 \text{ teeth. } (\textit{Dobson.})$$

SUB-ORDER I.—MEGACHIROPTERA.

Crowns of the molar teeth smooth, marked with a longitudinal furrow; palate bony, continued behind the last molar, narrowing slowly backwards. Second finger generally terminating in a claw. Sides of the ear-conch forming a complete ring at the base. Pyloric extremity of the stomach elongated. Frugivorous.

Family, PTEROPODIDÆ.

Characters same as those of the sub-order.

Pteropus, *Briss. Quadrup.* p. 153; *Geoff. Ann. du Mus.* xv. p. 90; *Dobson, Monog. As. Chir.* p. 15; *Cat. Chir. Br. Mus.* p. 15 (1878).

Muzzle long, narrow, and cylindrical; nostrils projecting, the extremity of the muzzle deeply emarginate. Upper lip with a vertical groove in front, bounded laterally by rounded, naked prominences; index or second finger with a distinct claw; metacarpal bone

of the middle finger shorter than the second finger. Wing membrane attached to the back of the first phalanx of the second toe, and from the sides of the hairy back. Tail none.

Dentition. Inc. $\frac{4}{4}$, c $\frac{1-1}{1-1}$, pm. $\frac{2-2}{3-3}$, m. $\frac{3-3}{3-3}$.

Back of the head, neck and shoulders generally covered with fur, distinct in colour and quality from that of the back.

This genus includes the largest known bats.

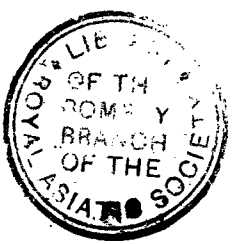
Pteropus medius, *Tem. Monog. Mammal* i., p. 176. P. Edwardsii, *Geoff.* (in part) *Ann. du Mus.* xv. p. 92; *Jerdon, Mammals of India* p. 18; *Hutton, Peters, Pro. Zoo. Soc.* 1872. P. Medius, *Dobson, Journ. As. Soc. Ben.* 1873; *Monog. As. Chir.* p. 18; *Cat. Chir. Br. Mus.* p. 51; *Anderson, Cat. Mam. Ind. Mus.* p. 101.

Ears long, with acutely-pointed tips, upper third of the margin concave beneath the tip, the largest diameter of the opening of the external ear 1½ inches. Except at the bases posteriorly and a narrow triangular portion covered with short hairs terminating towards the middle of the outer margin, the ears are naked. The anterior flattened edge of the inside of the conch is covered from the base upwards for about one-third the length of the ear. Face naked in front of a line joining the inner angles of the eyes, and on either side of the naked space a few long hairs arise from separate papillæ. Fur on the back of the head, neck and shoulders rather dense; on the back short and adpressed, and narrowing across the loins. Elbow naked. A few short hairs cover the narrow portion of the wing membrane, about an inch and a half long, posterior to the forearm. The femur and interfemoral membrane, as far as a line corresponding to the position of the semi-circular band on the under-surface of the membrane, are covered. The tibiæ and feet naked; the former sometimes with a few short hairs. Nape of the neck and shoulders reddish yellow, golden yellow, or pale straw colour; the chest and upper parts of the same colour, or sometimes of a darker hue. Face and throat reddish brown; crown of the head brighter. Sides of the body beneath the wings and round the pubis dark reddish brown. On each side of the neck, a circular tuft of rigid unctuous hairs of a reddish and yellow colour, covering the glands.

Length (of an adult ♂)—Head and body 10·5″, head 3″, ear 1·45″ × 0·8″, ear from end of nostril 2·8″, eye from end of nostril 1·2″, forearm 6·3″, second finger 11·9″, thumb 2·5″, fourth finger 8″, tibia 2·8″, foot and claws 2″.

Hab.—Sind (Jacobabad), Kutch, Madras, Bombay, Poona, Sholapore, Bhosawal, Nagpore, Nepaul, Assam, Ceylon, and Kelat (Dr. Bowman in Dobson's *Cat. Br. Mus.*), also Arracan and Burmah, Punjab (Umritsar), Delhi.

This is the only species of the genus as yet known to inhabit the Peninsula of India. It is generally found in colonies of one or two hundred; and the most commonly selected tree, especially in the Concan, Deccan, and Khandeish, for a diurnal retreat, is the common fig, (*Ficus religiosa,*) hanging on the branches of which the greater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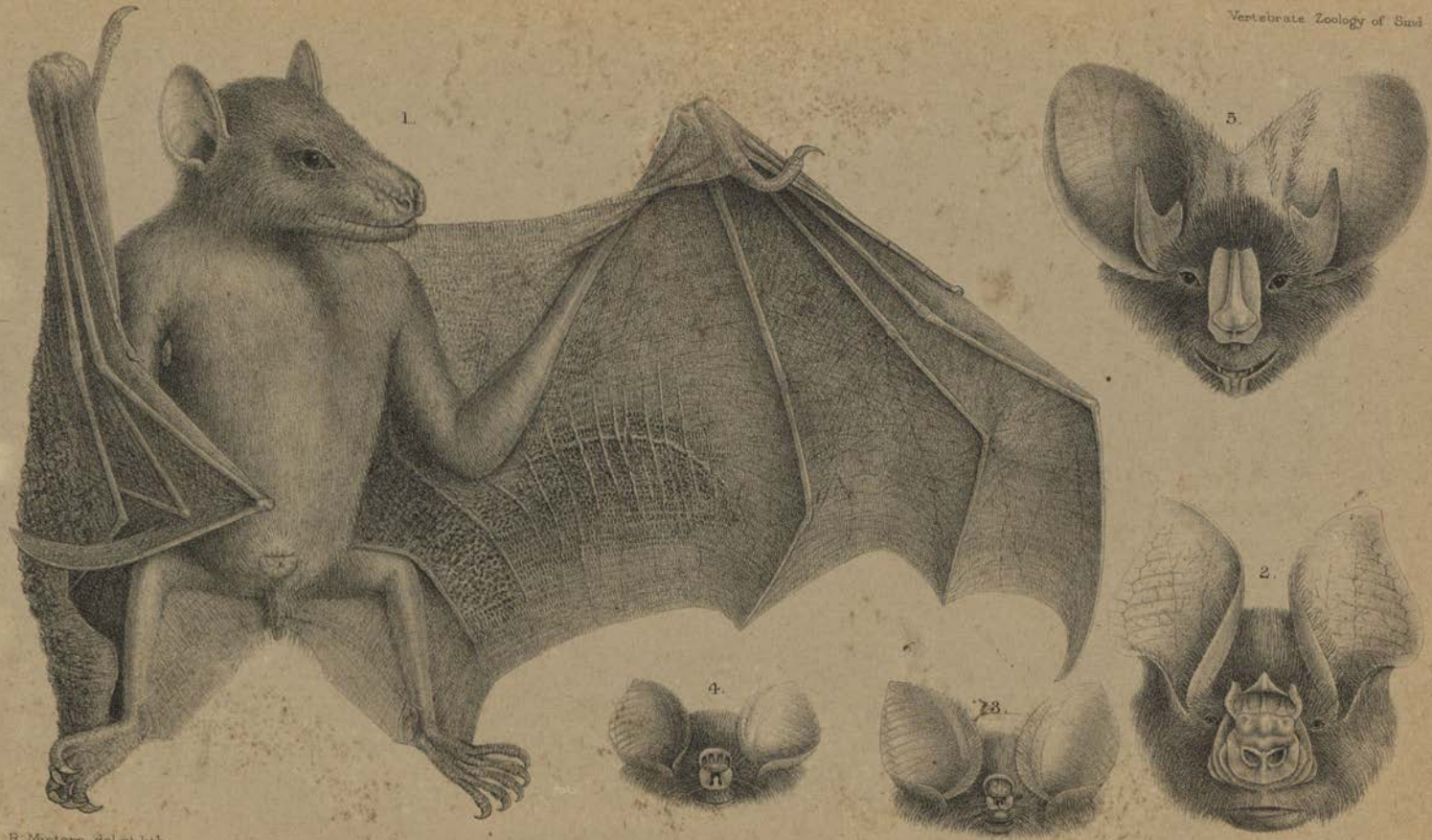


R. Mantern, del et lith.

1. CYNONICTERIS AMPLEXICANDATA. 2. PHYLLORTRINA TRIDENS.
3. P. FULVA. 4. P. BICOLOR. 5. MEGADERMA LYRA.

Mintern Bros. imp.

portion of the day is passed in sleep, after, perhaps, doing incalculable mischief the night previous. When food becomes scarce in their usual haunts, they are said to often travel great distances to obtain it, returning to their sleeping place about sunrise..

Medicinally the flesh of this species is recommended by native practitioners to be eaten as a curry in diabetic cases, as also in cases where muscular energy is deficient. The fat boiled down is a very favourite remedy in rheumatism of the joints.

Cynonicteris, *Peters, Reise nach. Mosamb. Saugeth.* p. 25; *Dobson, Monog. As. Chir.* p. 29; *Jour. As. Soc. Ben.* p. 202. Xantharpyiæ et Eleutherura, *Gray, Cat. Monkeys and Fruit-eating Bats* p. 115.

Muzzle long and conical; nostrils projecting by their inner margins; upper lip grooved in front with sloping margins. Index finger with a distinct claw. Metacarpal bone of the middle finger as long as, or longer than, the index finger. Wings from the sides of the back and base of the second toe. Tail short, distinct, partially included in the narrow interfemoral membrane.

Dentition—As in Pteropus.

Cynonicteris amplexicaudata, *Peters, M. B. Akad. Berl.* p. 865; *Dobson, Pro. As. Soc. Ben.* p. 154 (1870); *Jour. As. Soc. Ben.* 1873, p. 202, pl. xiv., fig. 8; *Monog. As. Chir.* p. 29; *Cat. Chir. Br. Mus.* p. 72; *Anderson, Cat. Mam. Ind. Mus.* p. 103. Pteropus Leschenaulti, *Desmar. Mamm.* p. 110. P. pyrivorous, *Hodgs. Jour. As. Soc. Ben.* 1835, p. 700.

PLATE I. Fig. 1.

Head long, triangular; edges of the groove on upper lip smooth, not thickened as in *Pteropus* and *Cynopterus*. Ears moderate, triangular, rounded at the tip, the upper half of the outer margin straight, the lower half convex. Posteriorly the ears are naked, except at their bases; anteriorly the conch is clothed with a few very short fine hairs. The fur of the body extends upon the humerus and upon the fleshy part of the forearm; the remaining part to the carpus has only a very few fine hairs. The portion of the back and wing membrane covered with fur across the loins is not more than an inch in breadth. The interfemoral membrane is densely covered with hair at the root of the tail, and on either side as far as lines drawn from the knee-joints to the base of the free portion of the tail; the remaining portion, the legs and a considerable part of the wing membrane beyond, are clothed with short thinly spread fur, which extends along the wing membrane and legs to the back of the feet. Beneath, the ante-humeral membrane is clothed with rather long, thinly spread fur, and the wing membrane is similarly covered as far as a line drawn from the knee to a point about half an inch posterior to the elbow. The interfemoral membrane, the legs and the feet, are covered with a few short hairs. Fur short, varying in colour from dark olive or smoky brown to reddish or yellowish brown. First upper premolars minute, equally distant from the canine and second premolar; second premolar exceeding lower canine in vertical extent; first lower premolar small, less than half the size of the second premolar; second premolar nearly equal to lower canine in vertical extent.

Length (*of an adult* ♂).—Head and body 4·3″ to 5·0″, tail 0·7″, head 1·65″, eye from nostril 0·6″, ear 0·75″, forearm 3·35″, thumb 1·0″, third finger metacarpal 2·1″, first phalanx 1·4″, second phalanx 1·85″, fifth finger metacarpal 1·9″, first phalanx 1·0″, second phalanx 1·0″, tibia 1·5″, foot 0·85″.

Hab.—Occurs in Sind (Mukklee Hills), inhabiting old tombs and the caves at Clifton; found also in the Persian Gulf inhabiting caves. Dobson gives its *habitat* as from the Persian Gulf to the Philippine Islands, Bengal, Southern India, Ceylon, Burmah, Celebes, Amboyna, and Aru Island.

Cynopterus, *F. Cuv. Dents de Mammifer,* p. 39; *Gray, Cat. Fruit-eating Bats, &c.*; *Dobson Monog. As. Chir.* p. 23; *Cat. Chir. Br. Mus.* p. 80.

Muzzle much shorter than in *Cynonicteris* and comparatively thicker; nostrils projecting, deeply emarginate between; upper lip with a narrow vertical groove in front, bounded laterally by naked prominences as in *Pteropus*. Index finger with a distinct claw; metacarpal bone of middle finger longer than the index finger; wings from the sides of the hairy back, and from the first toe. Tail short, distinct.

Dentition. Inc. $\frac{4}{4}$ or $\frac{4}{2}$, c $\frac{1-1}{1-1}$, pm. $\frac{3-3}{3-3}$, m. $\frac{1-1}{2-2}$.

General form of teeth as in *Cynonicteris*, but less in number; the last upper and last two lower molars absent.

Cynopterus marginatus, *F. Cuv. Dents de Mammifer.* p. 39; *Kelaart, Prod. Faun. Zeyl.* p. 28; *Jerdon, Mamm. of India* p. 20; *Gray, Cat. Monkeys and Fruit-eating Bats* p. 122; *Dobson, Jour. As. Soc. Ben.* 1873, p. 200, pl. xiv., fig. 4 (ear); *Monog. As. Chir.* p. 24; *Cat. Chir. Br. Mus.* p. 81; *Anderson, Cat. Mam. Ind. Mus.* p. 104. Pteropus marginatus, *Geoff. Ann. du Mus.* xiv. p. 97; *Tem. Monog. Mammal* i., p. 202; pl. xiv. P. pyrivorus, *Hodgs. Pro. Zoo. Soc.* p. 36, 1836. Cynopterus horsfieldi, *Gray, Cat. Mam. Br. Mus.* p. 38; Pachysoma brevicaudatum, *Is. Geoff. Dict. Class. Hist. Nat.* xiv., p. 705.

Ears large, rounded at the tip, with a slight but distinct concavity of the outer margin immediately beneath the tip; outer and inner margins of the ear-conch bordered with white, the border along the inner margin one-twelfth of an inch wide, contrasting strongly with the dark brown colour of the ear. The outer margin terminates below without forming a lobe at the base. Except at their bases, the ears are naked posteriorly; anteriorly a few hairs appear upon the conch along the outer side of the white border of the inner margin, and similarly along the inner side of the white border of the outer margin. The fur on the upper surface of the body extends upon the wing membrane nearly as far as a line joining the elbow and knee-joints, also thinly upon the humerus, the femur and proximal end of the tibia; beneath, the wing membrane is clothed to about the same extent as upon the upper surface, the hairs also passing outwards in a narrow band posterior to the forearm. The colour of the fur is extremely variable,—dark brown, reddish brown, snuff

brown, or olive brown; sometimes with a bluish tinge throughout. The fur of the male is distinguished from that of the female, especially during the rutting season, by a collar of stiff radiating reddish yellow hairs. Upper incisors close together; short, equal in length; placed in a straight line in the space between the canines, from which a slight interval separates them on each side. Lower incisors somewhat smaller, forming a slightly arched row; the outer incisors on each side separated as above by a small space from the canine. First upper premolar minute, in the centre of the space between the canine and second premolar and slightly to the outer side of the tooth row; second premolar nearly equal to the lower canine in vertical extent.

Length (*of an adult* ♂).—Head and body 4·4″, tail 0·4″, head 1·5″, ear 1″×0·5″, ear from tip of nostril 1·2″, eye from tip of nostril 0·5″, forearm 3″, third finger 5″, fifth 3·7″, thumb 1·1″, tibia 1·1″, foot 0·7″.

Hab.—Sind (at the Mulleer and Larkhana). Occurs in India generally from the Himalayas to Cape Comorin, Ceylon, Andamans, Burmah, Sumatra, Java, Borneo and Philippine Islands. (*Dobson Monog. As. Chir.*; *Cat. Br. Mus.*)

This bat is a perfect pest at the Mulleer and in other places in Sind, from the havoc it commits in the plantain, guava and mango gardens.

SUB-ORDER II.—MICROCHIROPTERA.

Crown of the molar teeth acutely tubercular, marked by transverse furrows; bony palate narrowing abruptly, *not* continued behind the last molar. Second finger not terminated by a claw; outer and inner sides of ear-conch commencing anteriorly from separate points of origin; stomach simple, or with the cardiac extremity more or less elongated. Carnivorous or insectivorous. Rarely frugivorous.

Family, RHINOLOPHIDÆ.

Gray (in part) *Pro. Zoo. Soc.* 1866, p. 81; *Dobson Ann. and Mag. Nat. Hist.* 1875 xvi. p. 346; *Monog. As. Chir.* p. 36; *Cat. Chir. Br. Mus.* p. 99.

Bats with well developed foliaceous cutaneous appendages surrounding the nasal apertures, which are situated in a depression on the upper surface of the muzzle; with large, generally separated ears, and no tragus. Two phalanges in the middle finger and an imperfect index finger without a phalanx. Premaxillary bones rudimentary, suspended from the nasal cartilages. The dental formula never exceeds

$$\text{Inc.}\ \frac{2}{4},\ \text{c}\ \frac{1-1}{1-1},\ \text{pm.}\frac{2-2}{3-3},\ \text{m.}\frac{3-3}{3-3}=32.$$

Upper incisors rudimentary. First upper molar minute. Molars well developed with W-shaped cusps. Nasal appendages complicated, consisting of (1) a horizontal nose-leaf, generally horseshoe-shaped; (2) central nose-leaf or sella; (3) the terminal or posterior nose-leaf, which arises vertically, or extends backward between the ears; skull large; nasal bones supporting the cutaneous appendages, expanded vertically and laterally; tibia long and straight; fibula rudimentary. Females

with two nipple-shaped appendages slightly in front of the pubis. Tail distinct, produced to the posterior margin of the interfemoral membrane.

Sub-Family I.—RHINOLOPHINÆ.

First toe with two, remaining toes with three, joints each; ilio-pectinal spine not connected by bone with the antero-inferior surface of the ilium.

So far as is known, this sub-family is not represented in Sind; but it is not improbable *Rhinolophis affinis, Horsf.*, and *Rhinolophis minor, Horsf.*, may occur.

Sub-Family II.—PHYLLORHININÆ.

Toes equal, with two phalanges each; ilio-pectinal spine united by a bony isthmus, with a process derived from the antero-inferior surface of the ilium forming a large pre-acetabular foramen.

Phyllorhina, *Bonass, Dobson Jour. As. Soc. Ben.* 1872, p. 141; *Monog. As. Chir.* p. 58; *Cat. Chir. Br. Mus.* p. 127; Hipposideros, *Gray Pro. Zoo. Soc.* 1834, p. 53.

Nose-leaf complicated, consisting of three portions, anterior, posterior and intermediate; the anterior horseshoe-shaped, as in *Rhinolophus*, but not similarly emarginate in front; posterior erect, with a convex, lobed, or incised free edge, concave in front, the concavity simple or divided by narrow vertical ridges; the intermediate, usually broadly cordiform with the base upwards, the sides thickened, the centre with or without a projecting point or longitudinal ridges in front.

Dentition. Inc. $\frac{2}{4}$, c. $\frac{1-1}{1-1}$, pm. $\frac{2-2}{2-2}$ $\left(\frac{1-1 \text{ in ph.}}{2-2 \text{ tridens}}\right)$, m. $\frac{3-3}{3-3}$.

First upper molar minute, blunt, in the outer angle between the canine and second premolar; rarely deciduous.

Phyllorhina tridens, *Peters, M. B. Akad. Berl.* 1871, p. 314; *Dobson Cat. Chir. Br. Mus.* p. 131, pl. viii. fig. 3; *Anderson, Cat. Mam. Ind. Mus.* p. 113; Rhinolophus tridens, *Geoff. Desc. de l'Egypt*, pt. ii. p. 130. Aselia tridens *Gray, Pro. Zoo. Soc.* 1866, p. 82.

PLATE I.

Ears nearly as long as the head, subacutely pointed, broad; lower two-thirds of the inner and outer margin of the ear-conch almost equally convex, the outer margin concave immediately beneath the tip, the remaining part convex. Upper margin of the transverse erect nose-leaf divided into three thickened projections, the concave front surface beneath divided by three longitudinal bands; sella cordate, prominent; horseshoe-shaped membrane circular and raised in front, not divided; two secondary leaves on the sides of the muzzle parallel to the horse-shoe.

Wings from the lower third of the tibiæ; interfemoral membrane short, square behind; the last osseous caudal vertebræ and half the antepenultimate vertebræ free. Fur above pale yellowish white, with brown extremities; beneath, wholly yellowish white or pure white. The first minute upper premolar deciduous.

Length.—Head and body 2″, tail 0·75″, head 0·7″, ear 0·65″ × 0·5″, forearm 1·75″, thumb 0·3″, third finger metacarpal 1·15″, first phalanx 0·5″, second phalanx 0·6″, fifth finger metacarpal 0·9″, first phalanx 0·4″, second phalanx 0·3″, tibia 0·65″, foot 0·35″.

Hab.—Sind (Kurrachee) in swarms during April, just at dusk, and N. E. Africa (Egypt, Zanzibar).

Var Murraiana—*Anderson, Cat. Mam. Ind. Mus.* p. 113.

Dr. Anderson (*Cat. Mamm. Indian Museum* 1881) says:—"This is distinguished from typical *P. tridens* by its somewhat shorter, broader, and less pointed ears, but which otherwise conform to the characters of the ears of *P. tridens*. The projections from the upper noseleaf are more marked than in *P. tridens* from Egypt. The interfemoral and wing membranes are prolonged somewhat further down the tibia than is the case in bats of this species from Egypt, and the former membrane reaches the proximal end of the penultimate osseous caudal vertebræ.

It attains to a larger size than any from Egypt. Measurements of an adult ♂,—total length of body 2·30″; tail 1″, head 0·80″, ear 0·70″, breadth of ear 0·68″, forearm 2·07″, thumb 0·32″, third finger metacarpal 1·46″, first phalanx 0·64″, second phalanx 0·66″; fifth finger metacarpal 1·16″, first phalanx 0·60″, second phalanx 0·45″; tibia 0·74″, foot 0·40″.

Hab.—Sind (Kurrachee) and the Persian Gulf.

Phyllorhina speoris—*Peters, M. B. Akad. Berl.* 1871, p. 320; *Dobson, Monog. As. Chir.* p. 67, fig. *a. b.*; *Cat. Chir. Br. Mus.* p. 143; *Anderson, Cat. Mam. Ind. Mus.* p. 116. Vespertilio speoris, *Schn. Schreb Saugeth.* pl. 59; Hipposideros speoris, *Blyth Jour. As. Soc. Ben.* 1844, p. 489. Hipposideros speoris et templetonii, *Kelaart, Prod. Faun. Zeyl.*

Slightly larger than *Phyllorhina tridens* and with long and narrower ears, owing to the less convexity of their inner margins; upper third of the inner margin of the ear conch slightly convex almost straight, tip narrowly rounded off or sub-acutely pointed, not projecting outwards. Upper third of the outer margin equally concave, lower two-thirds convex, with a small but very distinct spine-like projection at the commencement of the lower third. Horseshoe-shaped horizontal nose-leaf narrow, with three parallel leaflets on the muzzle on each side; transverse terminal leaf broader than the sella; upper margin regularly convex, front concave surface with three very distinct vertical ridges whereof the centre one is longest; a large frontal sac in the male, with a transverse aperture and swollen margins; in females much smaller.

Wing membrane from the tibiæ near the ankle, interfemoral membrane short, square behind; the last osseous caudal vertebræ and half of the antepenultimate vertebræ free. Fur, above, brown; white at the base; beneath, similar but paler. The shade of brown varies considerably in different individuals.

Length.—Head and body 2·4″, tail 0·85″, tail free from membrane 0·12″, head 0·85″, ear 0·7″ × 0·5″, forearm 2·05″, thumb 0·3″, third finger 2·75″, fifth finger 2·25″, tibia 0·9″, calcaneum 0·5″, foot 0·38″.

Hab.—Sind (Kurrachee), Deccan (Poona), Madras, the Peninsula of India generally, Ceylon, Burmah, and Java.

Phyllorhina fulva, *Peters, M. B. Akad. Berl.* 1871, p. 322; *Dobson Pro. As. Soc. Ben.* 1872, p. 155; *Monog. As. Chir.* (*Sub Sp. A*); *Anderson, Cat. Mam. Ind. Mus.* p. 118. Phyllorhina bicolor, *Cat. Chir. Br. Mus.* p. 149, pl. ix., fig. 10; Phyllorhina aurita, *Tomes, Pro. Zoo. Soc.* 1859, pl. 76; Hipposideros cineraceus, *Blyth, Jour. As. Soc. Ben.* xxii. p. 410; *Jerdon, Mammals of India* p. 28. H. fulvus, murinus, atratus, *Kelaart Pro. Faun. Zeyl.*

PLATE I.

Ears longer than the head, with a very slight flattening of the upper third of the outer margin beneath the broadly rounded-off extremity of the conch. Horseshoe small, square, scarcely as wide as the transverse terminal leaf, the concave front surface of which is divided into four cells, by three distinct vertical ridges. No secondary leaflets external to the horseshoe. Frontal glandular sac well developed, rudimentary in females. Wings to the ankles or tarsus, interfemoral membrane slightly angular behind; the end of the tail projecting. Fur, above, white for three-fourths its length, with brown or dark reddish brown or black extremities; beneath, pure white or pale yellowish white, or the white replaced both above and beneath by brilliant golden yellow, in which case the extremities of the hairs on the upper surface are a rich reddish chestnut. The brilliancy of the fur in some specimens is, Mr. Dobson says, probably unequalled by that of any other species of mammal, and states his opinion that it may be analogous to the breeding plumage in birds.

It is restricted to females during the breeding season.

Length.—Head and body 1·75″, tail 1·15″, head 0·75″; ear 0·9″, forearm 1·55″, third finger 2·3″, fifth finger 1·9″, tibia 0·65″, foot 0·32″.

Hab.—Sind (Kurrachee), Kutch, Bombay, Punjab Salt Range, Madras, Ceylon, Upper Burmah, Assam.

Family, NYCTERIDÆ.

Dobson, Ann. Mag. Nat. Hist. 1875; *Monog. As. Chir.* p. 75; *Cat. Chir. Br. Mus.* p. 154.

Bats with distinct cutaneous appendages margining the apertures of the nostrils, which are situated on the upper surface of the muzzle; ears united, large; tragi well developed; mammæ pectoral. Two phalanges in the middle finger, whereof the first is extended (in repose) in a line with the metacarpal bone, and with or without a short phalanx in the index finger; tibiæ long, but the fibulæ rudimentary or absent. Premaxillary bones cartilaginous or small; upper incisors absent or very small in the centre of the space between the canines; molars well developed with acute W-shaped cusps.

Sub-Family I.—MEGADERMINÆ.

Nostrils at the bottom of a cavity, near the extremity of the muzzle, concealed by the base of an erect cutaneous process. Tail very short in the base of the large interfemoral membrane. Premaxillaries cartilaginous.

Megaderma, *Geoff. Ann. du Mus.* xv. p. 197; *Dobson, Monog. As. Chir.* p. 75; *Cat. Chir. Br. Mus.* p. 154.

Muzzle cylindrical, elongated; nostrils in a slight depression at the extremity of the upper surface of the muzzle surrounded by a naked cutaneous expansion. Lower lip projecting slightly beyond the upper. Ears large, conjoined by part of their inner margins. Tragus long, bifid. Wings ample. A single very short bony phalanx in the index finger. Fourth and fifth metacarpal bones progressively longer than the third. Tibia very long. Toes nearly equal in length; the outer or first with two, the remaining with three, phalanges each. Calcaneum distinct. Tail very short, not discernible except in skeletons. Interfemoral membrane large, concave behind. A pair of pubal appendages.

Dentition. Inc. $\frac{0}{4}$ c. $\frac{1-1}{1-1}$, p.m. $\frac{2-2}{2-2}$, m. $\frac{3-3}{3-3}$.

First upper premolar small or absent, last molar less than half the antepenultimate molar. Bony palate, not extending backwards beyond the last molar. Zygomatic arches very wide; frontal bones flattened and slightly expanded laterally. The base of the post-orbital process perforated by a small foramen. The infra-orbital foramen converted into a long canal, opening near the second premolar.

Megaderma lyra, *Geoff. Ann. du Mus.* xv. p. 190; *Blyth, Jour. As. Soc. Ben.* xi. p. 254, 1842; xx., p. 156, 1851; *Dobson, Pro. As. Soc. Ben.* 1872, p. 208; *Monog. As. Chir.* p. 78; *Cat. Chir. Br. Mus.* p. 156, pl. x., fig. 2; *Anderson, Cat. Ind. Mus.* p. 120.—THE LARGE-EARED VAMPIRE BAT.

PLATE II.

Ears considerably longer than the head, oval, broadly rounded off above; outer and inner margins slightly convex, the outer terminating abruptly midway between the base of the tragus and the angle of the mouth. Nose-leaf long, narrow, truncate above, with straight not converging sides; its horizontal base circular, with a free margin, forming a concave disc above the extremity of the muzzle, with the opening of the nostrils at the bottom of the concavity; its anterior surface with a prominent central longitudinal ridge, corresponding to a deep groove on the posterior surface of the leaf, expanded below into a circular disc, the margins of which conceal the nasal apertures. The projecting lip has a prominent triangular naked space in front, divided by a longitudinal groove. Wing membrane *from the back of the foot*, attached close to the base of the outer toe; interfemoral membrane square behind. Calcaneum short, feeble; tail short, concealed within the base of the interfemoral membrane. Fur of a slaty blue colour, extends densely upon the humerus and muscular part of the forearm. The four lower incisors are equal in vertical extent, bifid, and not crowded.

Length.—Head and body 3·4″, ear 1·7″, tragus 0·7″, nose-leaf 0·55″, forearm 2·7″, third finger 4·7″, fifth finger 3·1″, tibia 1·4″, foot 0·65″.

Hab.—Sind (Kurrachee); Bombay, Nassick (Khandeish), Madras, Bengal, the Peninsula of India generally, Nepal and Ceylon. Jerdon

(*Mammals of India*) says this species is very abundant in the cave temples of Ellora and Ajunta, and adds that Blyth fully ascertained that at times it sucks the blood from other bats, fixing on them behind the ear.

Family, VESPERTILIONIDÆ.

Dobson, Ann. and Mag. Nat. Hist. 1875, p. 347; *Monog. As. Chir.* p. 82; *Cat. Chir. Br. Mus.* p. 167.

Nostrils opening by simple crescentic or circular apertures at the extremity of the muzzle, without foliaceous or cutaneous appendages. Ears moderate, generally separate, inner margins arise from the sides of the head. Tragi comparatively large. Middle finger with two phalanges, the first (in repose) in a line with the metacarpal bone; legs short; fibulæ rudimentary. Tail long, contained in and produced to the hinder margin of the interfemoral membrane. Upper incisors small, placed in pairs or singly near the canines. Molars well developed with acute W-shaped cusps.

Vesperugo, *Keys and Blas. Wieg. Archiv.* 1839.

Muzzle generally very broad and obtuse, glandular prominences between the eyes and nostrils well developed, increasing the width of the face. Crown of head flat, or very slightly raised above the facial line. Ears generally shorter than the head, separate, broad and triangular, the outer margin extending forwards beyond the base of the tragus, the internal basal lobe rounded. Tragus generally short and obtuse, the outer margin more or less convex, the inner straight or concave. Tail less than the length of head and body. The calcaneum generally supports on its posterior margin a small rounded cutaneous lobe (*the post-calcaneum lobe*). Feet short and broad; membrane thin. Upper incisors in pairs separated by a wide interval; first upper premolar minute or absent. First lower premolar in the tooth row not crushed in between the adjoining teeth; its summit directed slightly outwards.

Vesperugo serotinus, *Schreb. Saugeth* 1. p. 167, pl. 53; *Keys and Blas. Wieg. Archiv.* 1839; *Dobson Monog. As. Chir.* p. 108, fig. *A.*; *Cat. Chir. Br. Mus.* p. 191; *Anderson, Cat. Mam. Ind. Mus.* p. 124. Vesperus shiraziensis, *Dobson. Jour. As. Soc. Ben.* 1871, p. 459; *Blanf. Eastern Persia* p. 21. Vesperus turcomanus, *Eversm. Bullet de Mosc.* 1840. Scotophilus serotinus, *Jerdon, Mammals of India*, p. 34.

Muzzle thick, conical; glandular prominences less developed than in the species of *Vesperugo*. Nostrils opening sub-laterally, separated by a narrow concave space. The tips of the ears laid forward extend more than midway between the eyes and the end of the nose. Inner basal lobe rounded, lower-third of inner margin very convex forwards; upper two-thirds faintly convex, broadly rounded at the tip. Tragus about twice as long as broad, reaching its greatest width slightly above the base of the inner margin, then lessening in width to the tip, which is obtusely pointed; inner margin straight or concave. Thumb with a small callosity at the base. Wings from the metatarsus close to

the base of the toes; post-calcaneum lobe shallow. Last two caudal vertebræ free; the projecting portion twice as long as the thumb. Face covered with short fur. Upper lip fringed with straight hairs, which also cover the chin, radiating outwards from a small central wart beneath; above, dark brown, deep bay, or smoke brown, with pale brown tips; beneath, yellowish brown. Upper incisors bifid, the cusps equal in length. Outer incisors very short, scarcely more than one-third of the length of the inner incisors. Lower incisors trifid.

Hab.—Sind, Persia, Himalayas and Mussoorrie. Dobson gives its *habibat* as the Palæartic, Æthiopian, Oriental, Neartic, and Neotropical regions. In the first, distributed generally from England to Siberia and from North Germany to Northern Africa, extending through Arabia and Asia Minor to India; in the Æthiopian region as far south as the Gaboon.

Vesperugo nasutus, *Dobson, Jour. As. Soc. Beng.* 1877, p. 311; *Cat. Chir. Br. Mus.* p. 200; *Anderson, Cat. Mam. Ind. Mus.* p. 125.

Head flat, muzzle conical, the extremity projecting considerably beyond the lower lip in front, terminated by the margins of the nostrils, which open sublaterally. Ears shorter than the head, triangular, with rounded off tips; the inner margin commences above the eye, and does not form a distinct rounded lobe at its base, but is almost straight from the base to the tip of the ear; the outer margin also straight and terminates rather abruptly midway beneath the tragus and the angle of the mouth. Tragus much longer than broad, directed slightly inwards, reaching its greatest width below the middle of its inner margin; outer margin convex, with an ill-defined lobe near the base; tip subacutely pointed. Tail almost wholly contained in the interfemoral membrane, the last rudimentary caudal vertebræ alone free. No post-calcaneum lobe. Wings from the base of the toes. Fur short; above pale yellowish brown; beneath, pale buff almost white; membranes light brown, traversed by numerous white reticulations. Face nearly naked in front of the eyes: a few hairs fringe the lips. Wing and interfemoral membrane almost naked; upper incisors long, unicuspidate; outer short. Lower incisors trifid, placed across the direction of the jaws. The single upper premolar close to the canine, as in *Vesperugo serotinus*, the first lower premolar not half the second in vertical extent, with a prominent internal and anterior basal cusp.

Length.—Head and body 1·8″, tail 1·7″, head 0·68″, ear 0·6″, tragus 0·25″, forearm 1·45″, thumb 0·45″, third finger (metacarpal) 1·3″, first phalange 0·48″, second phalange 0·7″; fourth finger (metacarpal) 1·3″, first phalange 0·4″, second phalange 0·4″; fifth finger (metacarpal) 1·3″, first phalange 0·28″, second phalange 0·28″; tibia 0·55″, foot 0·28″.

Hab.—Shikarpoor and Sukkur (Sind). Not known outside the province.

Vesperugo abramus, *Dobson, Monog. As. Chir.* p. 97; *Cat. Chir. Br. Mus.* p. 226; *Anderson, Cat. Mam. Ind. Mus.* p. 129. Vespertilio abramus, *Tem. l. c.* p. 232, pl. 58. Scotophilus coromandelicus, *Horsf. Ann. and Mag. Nat. Hist.* 1855, p. 5. Pipistrellus coromandelicus, *Dobson, Jour. As. Soc. Ben.* 1871, p. 461; *Murray, Hdbk. Zool, &c. Sind*, p. 68.—The Coromandel Bat.

Muzzle obtuse; glandular prominences on the sides large, rounded, adding more to the width than to the depth of the muzzle and causing a furrow between them and the crown of the head. Ears triangular, outer margin straight or very slightly concave. Tragus rather short, its inner margin concave. Feet small; wing membrane attached to the base of the toes; post-calcaneum lobe distinct, rounded; last rudimentary caudal vertebræ free. Head and face densely furred; the space in front of the ears, about the eyes, and the extremity of the muzzle generally, almost naked. Laterally the fur of the body covers only the proximal third of the humerus and half the femur, and its extent upon the wing membrane is limited to a narrow portion along the sides of the body; beneath, the humerus and femur are similarly covered, the fur extending as far as a line drawn from the elbow to the knee-joint. The upper surface of the interfemoral is covered as far as the end of the third caudal vertebræ; beneath, the fur of the abdomen covers the root of the tail only, the remaining portion is clothed with very short thinly spread hair.

Above, dark brown, the fur tipped with light yellowish brown; the head, face, and neck wholly yellowish brown: beneath, soot brown, the extremities of the hairs much paler than upon the upper surface. Upper incisors long and bifid; the external cusp placed slightly posteriorly. Lower incisors not crowded. The second upper premolar separated by a slight interval from the canine.

Length.—Head and body 1·8″, tail 1·5″, head 0·65″, ear 0·5″, tragus 0·23″, forearm 1·35″, thumb 0·25″, third finger 2·45″, fifth finger 1·75″, tibia 0·5″, foot 0·3″.

Hab.—Generally distributed throughout India and through Burmah and China to Southern Japan, the islands of the Malay Archipelago, and North Australia. During the summer it is found throughout the middle of Europe from the Rhine to Southern Russia and from Northern Germany to the Mediterranean, even extending into Sweden (*Dobson*).

Vesperugo kuhlii, *Blas. Faun. Deutsch; Dobson, Monog. As. Chir.* p. 94; *Cat. Chir. Br. Mus.* p. 230. Vespertilio kuhlii, *Natt. in Kuhl. Deutsch. Fled. Wet. Ann.* iv., p. 28; *Temm. Monog. Mammals* ii., p. 196; *Anderson, Cat. Mam. Ind. Mus.* p. 131. Scotophilus lobatus, *Jerdon, Mammals of India*, p. 35. Vesperugo leucotis, *Dobson, Jour. As. Soc. Ben.* 1872, p. 212.—The Lobe-eared Bat.

Ears and tragus generally larger than those of *V. abramus*. Ears triangular; base of inner margin very convex forwards, tip of the ear obtusely rounded off, outer margin flatly emarginate above for more than one-third its length, causing the tip to project slightly; the lower two-thirds slightly convex, the edge reflected backwards, terminating

at a short distance behind the angle of the mouth. The greatest breadth of the tragus slightly below the middle of the inner margin; the triangular lobule above the base of the outer margin is succeeded by a slight concavity. Wings from the base of the toes; feet small; calcaneum very long; post-calcaneum lobe distinct, rounded; extreme tip of tail free. The posterior edge of interfemoral and wing membrane generally margined with white. Membranes and ears, in Sind specimens, white, as also in specimens from Beloochistan and Northern India, answering to Dobson's description of *V. leucotis*. Ears, sides of face about the eyes, interfemoral, antebrachial, and the wing membrane near the sides of the body white, very translucent; remaining part of the wing membrane traversed by distinct white reticulations. On the upper surface the fur is black at the base for about half the length, remaining portion light yellowish brown; beneath similar, but the extremities of the hairs much paler, almost white. Glandular prominences on the muzzle greatly developed in a vertical direction so as to cause a considerable depression between them on the face. Inner upper incisors long and acutely pointed. Outer incisors scarcely one-fourth the length of the inner ones; first upper premolar very small; lower incisors trifid and slightly crowded.

Length.—(Of an adult ♂) head and body 1·75 inches, tail 1·5″, ear 0·55″, tragus 0·25″, forearm 1·35,″ thumb 0·25″, third finger 2·4″, fifth finger 1·7″, tibia 0·45″, foot 0·28.″

Hab.—Southern Europe, countries south of the Pyrenees and the Alps; Northern Africa, Southern Asia, Palestine, Sind, Persia, Beloochistan, Afghanistan, Madras, Calcutta, probably generally distributed throughout these countries and India.

Vesperugo maurus, *Blasius, Wiegm. Arch.* 1853, p. 35; *Dobson, Cat. Chirop. Br. Mus.* 1878, p. 218; *Anderson, Cat. Mammals Ind. Mus.* p. 127.

Muzzle broad and flat above, the glandular prominences on each side well developed and increasing the width of the muzzle; nasal orifices opening almost on a level with the front surface of the muzzle, without intervening emargination. Ears broad, triangular, broadly rounded off above; the outer margin straight above for nearly half its length, then slightly convex to the base, terminating midway between the base of the tragus and the angle of the mouth in a small lobe. Tragus broad, reaching its greatest breadth above the middle of the inner margin; at the base of the outer margin a distinct triangular lobule, succeeded above, immediately below the middle of the outer margin, by a second but very small projection, indistinct in some specimens; inner margin straight, outer margin parallel to the inner margin, convex above.

Toes about half the length of the whole foot; last caudal vertebræ free, especially in the smaller specimens of this species. Fur long and dense on the body; extends in front forward on the face as far as a line drawn between the eyes; behind it, it projects over the base of

the interfemoral membrane, but does not extend upon it; laterally it covers a very narrow portion of the wing membrane, above and beneath, along the sides of the body. The interfemoral membrane is naked above, except a few fine and invisible hairs on the first and second vertebræ. Beneath it is covered for more than two-thirds its extent with short greyish hairs, thickest at the root of the tail.

Above and beneath deep black or very dark brown, the extreme tips on the posterior half of the back greyish; beneath the tips of all the hairs are greyish; cutaneous system black; the nose, ears, and all the naked glandular prominences on the upper lip intensely black; upper incisors nearly equal in length; the inner one on each side bifid, its outer and shorter cusp directed slightly backwards and in a plane posterior to the outer incisor, which equals or somewhat exceeds it in vertical extent; lower incisors crowded, overlapping; first upper premolar small, quite external to the tooth row, not visible in the small northern forms; second premolar close to the canine.

Length.—Head and body 1·9″ to nearly 2 inches, tail 1·3″, free from membrane 0·12″, ear 0·62″, tragus 0·23″, forearm 1·35″, third finger 2·2″, fifth finger 1·6″.

Hab.—Sind, the Deccan, Khasia Hills, Java, Canary Islands, Switzerland, and China.

Scotophilus, *Leach, Trans. Lin. Socy.* xiii., p. 71; Nycticejus, *Temminck, Monog. Mamm.* ii., p. 148.

Muzzle short, obtusely conical, smoothly rounded off, naked; nostrils close together, opening by simple lunate apertures in front or sublaterally, their inner margins projecting; ears longer than broad, generally much shorter than the head with rounded tips, the outer margin terminating behind the angle of the mouth in a distinct convex lobe. Tragus tapering, generally subacutely pointed and curved inwards.

Tail shorter than head and body, contained, except the terminal rudimentary vertebræ, within the interfemoral membrane; calcaneum weak; wings attached close to the base of the toes; wing and interfemoral membranes very thick and leathery.

Dentition. Inc. $\frac{1-1}{6}$, c. $\frac{1-1}{1-1}$, p.m. $\frac{1-1}{2-2}$, m. $\frac{3-3}{3-3}$

Upper incisors long, unicuspidate, acute; upper premolar large, exceeding the molars in vertical extent and quite close to the canine; last upper molar consisting of a transverse plate only, first lower premolar small, crushed in *between the canine and second premolar* which exceeds the molars in vertical extent. All the molar teeth strong with acute cusps.

Scotophilus Temminckii, *Gray, Mag. Zool. and Bot.* ii., p. 497; *Dobson, P. Z. S.* 1875, p. 370; *Monog. As. Chir.* p. 120; *figs. a and b. Cat. Chir. Br. Mus.* pl. xv., fig. 5. Nycticejus Temminckii, *Tem. Monog. Mammals* ii., p. 149; *Blyth. J. A. S. B.* 1851; *Cat. Mus. A. S. B.* p. 31. N. luteus, *Blyth, J. A. S. B.* xx., p. 157; *Jerd. Mamm. Ind.* p. 36. Scotophilus Kuhlii, *Leach. Trans. Lin. Socy.* xiii., p. 71; *Murray, Hdbk., Zool, &c., Sind*, p. 69.—The Bengal Yellow Bat.

Glandular prominences between the eyes and nose small, not causing a depression on the muzzle above. Ears short, narrow and rounded at the tips, the inner basal lobe square below, the horizontal part of its margin straight, forming a right angle with the ascending portion, the lower half of the inner margin straight or faintly concave, the upper half convex, the tips not projecting outwards. Tragus narrow, attenuated towards the tip, acutely pointed, much curved forwards and inwards, the lower third of the outer margin straight, with a distinct small horizontal lobule at the base, the upper two-thirds convex, inner margin concave; wing membrane attached to the side of the foot, near the base of the toes; postcalcaneal lobe narrow; extremity of the tail projecting. Fur on the upper surface confined to the body, scarcely extending upon the wing membrane; beneath the wing membrane is covered with fine hairs as far as a line drawn from the elbow to the knee joint. Interfemoral naked, except at the base of the tail where there are some scattered hairs. Colour very variable.

Length.—Head and body 3·1″, tail 2·1,″ head 1″, ear 0·65″, tragus 0·38×0·1″, forearm 2·3″, thumb 0·38″, third finger 3·65″, fifth finger 2·5″, tibia 0·9″, *foot* 0·45″.

Sind (Kurrachee), Kutch, Bombay, Madras, Calcutta, and throughout the Peninsula of India, Ceylon, Burmah, and Afghanistan.

Scotophilus Heathii, *Dobson, Monog. As. Chir.* p. 122; *fig. Cat. Chir. Br. Mus.* p. 260; *Var. A.; Murray, Hdbk., Zool, &c., Sind,* p. 69.

Similar to *S. Temminckii,* but in all measurements longer. Muzzle more conical; forearm, thumb, and tail relatively longer.

Length.—(Of an adult) Head and body 3·2″, tail 2·5″, head 1·1″, ear 0·75×0·5″, tragus 0·38×0·1″, forearm 2·45″, thumb 0·45″, third finger 4″, fifth finger 2·75″, tibia 1″, foot 0·5″.

Sind, Punjab, Bombay, Kutch, the Peninsula of India generally, and Ceylon.

Scotophilus pallidus, *Dobson, Monog. As. Chir.* p. 186; *Cat. Chir. Br. Mus.* p. 264, pl. xv., fig. 3; *Murray, Hdbk., Zool, &c., Sind,* p. 68.

Head and muzzle as in *S. Temminckii.* The internal basal lobe of ears convex, evenly rounded; the ascending inner margin slightly convex, tip rather broadly rounded off; the outer margin straight for half its length, concave opposite the base of the tragus, and terminating in a convex lobe. Tragus moderately long and rounded at the tip, not attenuated above, anterior surface smooth, inner margin straight or faintly concave, outer slightly convex, a prominent triangular lobule near its base. (*Plate* xv., *fig.* 3. *Dobs. Cat. Br. Mus*). Wings from the base of the toes; calcaneum weak; postcalcaneal lobe long and very narrow; last rudimental caudal vertebræ free. Colour above light chestnut brown, beneath brownish buff, the base of the hairs on both surfaces pale buff.

Dentition—As in *S. Temminckii.*

Length.—Head and body 2″, tail 1·4″, head 0·7″, ear 0·55″, tragus 0·23″, forearm 1·4″, thumb 0·25″, third finger—metacarpal 1·3″, 1st ph. 0·35″, 2nd 0·2″, tibia 0·48″, foot 0·28″.

Hab.—Sind and Punjab, at Mean Meer, near Lahore.

Of the Genus Vespertilio, a single species *V. desertorum* (*Dobson, A. and M. N. Hist.* 1875; *Asiatic Chir.* p. 144; *Blanf. Eastn. Persia*) has been found in Beloochistan, and will probably be found in Sind also.

Family, EMBALLONURIDÆ.

Dobson, Ann. and Mag. Nat. Hist. 1875, p. 347; *Monog. As. Chir.* p. 164.

Nostrils opening by simple or valvular apertures at the projecting extremity of the muzzle, *not* surrounded by or margined by distinct foliaceous appendages, except in *Rhinopoma*, which has a fleshy prominence resembling a nose-leaf; ears generally large, often united, arising by their inner margins from the sides of the forehead, with short, occasionally minute tragi, usually expanded above, with two phalanges in the middle finger, of which the first is folded (in repose) forwards on the upper surface of the metacarpal bone, with the tail partially free, either perforating the interfemoral membrane and appearing on its upper surface or produced far beyond its posterior margin.

Dentition—Variable.

Upper incisors in most genera are large, separated from the canines, and also in front and have their extremities directed slightly forwards and inwards. Molars well developed with distinct W-shaped cusps.

Sub-Family I.—EMBALLONURINÆ.

Tail slender, perforating the interfemoral membrane and appearing upon its upper surface, or terminating in it; legs long, fibulæ very slender; upper incisors weak.

Taphozous, *Geoff. Desc. de l'Egypte* ii., p. 126; *Temm. Monog. Mammals.* ii., p. 277; *Dobson, Monog. As. Chir.* p. 166.

Muzzle very conical, broad behind, very narrow in front, terminated by the slightly projecting inner margins of the valvular nostrils. Crown of the head very slightly raised above the face line; a deep frontal excavation between the eyes. Ears separate, the inner margin of the conch arising by a short band from the side of the frontal concavity; outer margin from a small lobe close to the angle of the mouth, but on a lower level. Tragus short, expanded above. Lower lip as long or slightly longer than the upper, terminating in front in two small triangular naked spaces separated by a more or less deep groove. A distinct horizontal groove on the face beneath. Thumb with a small, very acute claw; 1st phalanx of middle finger folded (in repose) on dorsum of metacarpal bone. Foot long and slender, the outer toe as long as the middle one, the inner toe shortest. Tail perforating the interfemoral membrane and appearing on its upper surface, capable of being partially withdrawn.

Dentition: Inc. $\frac{1-1}{4}$, c. $\frac{1-1}{1-1}$, pm. $\frac{2-2}{2-2}$, m. $\frac{3-3}{3-3}$

Premaxillaries cartilaginous, supporting a pair of small weak incisors often absent in adults. Canines close together much curved forwards, separated from the second premolar by a wide space, in

which the first minute premolar scarcely appears above the level of the gum. Last molar a narrow transverse bony lamina. Most of the species have a peculiar glandular sac between the angles of the lower jaw,—a sexual character; also a small band of integument which passes from the inferior surface of the forearm to the proximal extremity of the fifth metacarpal bone, forming with the wing membrane a small pouch,—the radio-metacarpal pouch.

Taphozous longimanus, *Hardw. Linn. Trans.* xiv. p. 525; *Tem. Monog. Mamm.* ii. p. 289; *Kelaart. Prod. Faunæ. Zeyl.* p. 12; *Dobson, P. A. S. B.* Aug. 1875, p. 55; *id. Monog. As. Chir.* p. 170; *Cat. Chir. Br. Mus.* p. 384.—The Long-armed Bat.

Gular sac well developed; in the females represented by a rudimentary naked fold of skin. Radio-metacarpal pouch moderately developed. Inner margin of the ear smooth. Wings from the ankles. Muzzle and face nude; the fur of the head extends slightly in front of the eyes. Inner side of ear conch rather thickly covered with moderately long fine hair; posteriorly the ear is almost naked, except a few fine hairs along the outer margin. On the upper surface of the body the fur extends upon the wing membrane as far as a line joining the middle of the humerus and femur; posteriorly the interfemoral membrane is covered as far as the point of exit of the tail, along which some long fine hairs extend. Beneath, under the chin (excepting the nude gular pouch) the fur is very short. Antebrachial membrane covered with longer fur than upon the upper surface. The interfemoral membrane posteriorly is naked, except at the root of the tail. Colour reddish or fuscous brown to black. Upper incisors small and very slender in some individuals; absent in the greater number of specimens.

Length.—Head and body 3·1″, tail 1·15″, head 0·95″, ear 0·8″, tragus 0·25″, forearm 2·45″, thumb 0·3″, 3rd finger 4·2″, 5th finger 2·15″, tibia 0·95″, calcaneum, 0·85″, foot 0·45″.

Hab.—Sind, Bombay, Madras, Calcutta, Travancore, the Indian Peninsula generally, Ceylon and Burmah.

Taphozous saccolæmus, *Tem. Monog. Mam.* ii. p. 285; *Dobson, Monog. As. Chir.* p. 172; *Cat. Chir. Br. Mus.* p. 388; T. pulcher, *J. A. S. B.* xiii. p. 491.—The White-bellied Bat.

Ears shorter than the head. Tragus concave on outer surface, upper margin convex, with a marginal fringe posteriorly, of fine hairs; inner margin of the ear conch smooth, not papillate. Gular sac well developed in both sexes. Lower lip with a deep narrow groove in the centre of its upper surface and in front. *No radio-metacarpal pouch.* Wings from the ankles. *Interfemoral membrane, legs, and feet naked.* Fur of the body on the upper surface scarcely extends on the wing membrane. Beneath, the chin and sides of the gular sac are covered with very short hair, the thorax and abdomen with moderately long fur, as on the upper surface. Fur, above, white at the base, the greater part of the hairs dark brown; the surface mottled with small irregular white patches; beneath reddish brown.

Length.—Head and body 3·5″, tail 1·3″, ear 0·8,″ tragus 0·23″, thumb 0·5″, 3rd finger metacarpal 2·75″, 1st ph. 1·15″, 2nd ph. 1·2″, fifth finger 2·65″, tibia 1·2″, foot 0·65″.

Hab.—Sind, Lower Bengal, Southern India, Sumatra, Java, Burmah, and the Malay Peninsula. Not known from Bombay or the Deccan; but probably occurs there also.

Taphozous Kachensis, *Dobs. J. A. S. B.* 1872, p. 221; *Sub. Sp.* of T. nudiventris, *Dobs. Monog. As. Chir.* p. 172.—THE KUTCH BAT.

Hab.—Sind and Kutch. Distinguished from *T. nudiventris* by the absence of the gular sac in both sexes, and slightly different measurements.

Length.—Head and body 3·6″, tail 1·25″, forearm 2·95″, 3rd finger metacarpal 2·7″.

Rhinopoma, *Geoff. Descrip. de l'Egypte* ii. p. 123; *Gray, P. Z. S.* 1866, p. 82; *Dobson, Monog. Asiat. Chir.* p. 174.

Crown of the head slightly elevated above the face line; muzzle thick, obtuse; the superior extremity projecting considerably beyond the lower lip. Nostrils valvular, in the front surface of a fleshy prominence at the anterior extremity of the muzzle; ears united across the forehead, which is deeply concave between the eyes as in *Taphozous*. Tragus distinct; *index finger with two phalanges*. Tail slender, produced considerably beyond the truncated interfemoral membrane.

Dentition. Inc. $\frac{2}{4}$, c. $\frac{1-1}{1-1}$, pm. $\frac{1-1}{2-2}$, m. $\frac{3-3}{3-3}$.

Upper incisors rudimentary, suspended from the small premaxillary bones, which are united in the centre and connected laterally by slender processes as in *Emballonura* with the maxillary bones. Nasal bones much expanded laterally and vertically, while posteriorly the frontal bones are depressed, forming a shallow concavity in the forehead.

Rhinopoma microphyllum, *Wagner. Supp. Schreb. Saugeth.* i. p. 444; *Dobson, Monog. As. Chir.* p. 174; *Cat. Chir. Br. Mus.* p. 400. Rhinopoma Hardwickii, *Gray. Zool. Misc.* p. 37; *Blyth, J. A. S. B.* xiii. p. 492; *Dobs. Cat. Chir. Br. Mus. Var. A. Sub Sp.*—THE LONG-TAILED LEAF-BAT.

Extremity of the muzzle thick, obtuse, obliquely truncated, projecting considerably beyond the lower lip. Nose leaf very small; upper margin convex, with a small raphe passing downwards between the nostrils; forehead with a deep circular concavity between the eyes, and a narrow groove along the centre of the muzzle to the base of the nose leaf. Ears shorter than the head; inner and outer margins slightly convex, the outer straight for a short distance immediately beneath the tip, the extremity rounded off, ending between the base of the tragus and the angle of the mouth, not forming a separate lobule near its termination; tragus longer than wide, the extremity obtuse and indistinctly irregularly toothed. At the base a small triangular lobule. Metacarpal bones of the index and of the second fingers equal in length, that of the fourth finger shorter than the second, but longer than that of the third finger. 1st ph. of mid-finger imperfectly flexed

backwards (in repose) upon the dorsal surface of the metacarpal bone. Tibia very long and straight; fibula very slender; feet long and slender, the first toe equal to the middle toe in length. Wing membrane from the lower third of the tibia. Calcaneum feeble; interfemoral membrane short, perforated close to its concave free margin by the long slender tail, which is produced beyond it to a distance equal to the length of the forearm. Face almost naked; margin of the upper lip fringed with fine hairs, which are dense on the truncated extremity of the muzzle. Fur on the back short and strictly limited to it. A considerable portion of the posterior part of the back naked. The skin of this part and of the wings near the body is covered with longitudinal and transverse wrinkles. The single upper premolar exceeds the molars in vertical extent, with a second vertical basal cusp on its outer and anterior side. Last molar less than half the ante-penultimate molar.

Length.—Head and body 3·0″, tail 2·35″, tail free from membrane, 1·65″, forearm 2·6″.

Hab.—Sind and the Indian Peninsula generally; N. W. P., South India, Bengal, Kashmir, also Africa and Asia Minor.

ORDER—INSECTIVORA.

Incisor teeth variable in number, and almost always different in the two jaws. No distinct canines in most; molars with acuminated tubercles. Feet usually pentadactylous, limbs short. Tail variously developed. Skull feeble and elongate, the bones of the face and jaws much produced, the latter weak. There are usually eight teeth in front of each jaw. The orbit and temporal fossæ confounded in one cavity, *except in Tupaia*. Molar teeth studded with sharp cusps or tubercles. Stomach simple, except in *Tupaia*. No cæcum. Mammæ ventral, generally numerous. The testes pass periodically from the abdomen into a temporary scrotum. Nocturnal animals, feeding chiefly on insects. They are divided into four families, Talpidæ or Moles, Soricidæ or Shrews, Erinaceidæ or Hedgehogs, and Tupaidæ or Tree Shrews. Soricidæ and Erinaceidæ only are represented in Sind.

Family, SORECIDÆ,—Shrews.

Body covered with soft hair. Eyes small, distinct, external ears in most generally small. Muzzle elongated. Middle incisors of upper jaw long and hooked, the lower ones slanting and lengthened. Three cuspidated molars in each jaw; a tuberculous tooth in the upper jaw. Snout lengthened, pointed and mobile. In some a gland under the skin which secretes a fluid of a musky odour. Habits nocturnal.

Sorex, *Linn.*; Pachyura, *De S. Longchamps*; Crocidura, *Wagner.*

Upper front teeth large and strongly hooked, longer than their posterior spur; inferior incisors entire or rarely a trace of a serrated upper edge. Following those in the upper jaw are four teeth anterior to the scissor tooth, the first large, next two much smaller, the third

exceeding the second, and the fourth diminutive. Teeth white. Ear conch distinct. Tail thick and tapering, furnished with a few long scattered hairs.

Dentition. Inc. $\frac{2}{2}$, c. $\frac{0}{0}$, m. $\frac{8-8}{5-5} = 30$.

All the Indian species inhabit old walls, stone heaps, hay ricks, kitchens, &c., living in holes in the ground. They are very pugnacious, and it is said if two are confined in a box, the weaker of the two will be found killed and partly devoured.

Lateral gland present.

Sorex cærulescens, *Shaw; Var Sindensis, Blyth. Cat.* 244; S. Indicus, S. Giganteus, S. Sonneratti, *Geoff*; *Var Sindensis, Anderson, J. A. S. B.* vol. xlvii. pl. ii. 1877; *Murray, Hdbk., Zool., &c., Sind,* p. 70.

Snout moderately long and pointed; ears full and rounded, sparsely clad, the margins and flaps, with longish, somewhat stiff hairs. Lower half of limbs seminude; feet slender and toes rather long. Tail rounded, slightly swollen at the base, and about four-fifth the length of the trunk. Fur moderately long, soft, and glossy, neutral grey and washed with umber, but not obscuring the grey; underparts neutral grey, with a silvery sheen in certain lights. Snout grey; feet yellowish, sparsely clad with whitish hairs. Claws rather long and hooked. Tail ringed, sparsely clad with white hairs with a few longer interspersed, but much shorter than in the generality of Indian shrews.

Length.—Tip of snout to vent 4·70 inches; tail 2·80″; hind foot 0·82″; tip of snout to eye 0·70″; eye to ear 0·39″; height of ear 0·38″; breadth of ear 0·38″. Upper incisors short and stout, curved, nearly convergent at their tips. No eminence of the cingulum on the inside of the posterior portion of the teeth which is rather broader than the base of the elongated portion. Second incisor not very large, but equalling the conjoint breadth of the third incisor and canine. Third incisor considerably smaller than the canine, but the tip of the latter is somewhat above the level of that of the former. The premolar is not very small, and it is nearly as broad as the canine, behind which it directly lies, but externally it is nearly wholly hidden by the first molar. The anterior cusp on the first molar and its large cutting cusp are not strongly developed, the point of the latter is below the level of that of the second incisor. The anterior portion of the frontals is not much narrower than the portion behind the orbits. Anterior margin of foramen magnum to tip of premaxilla, 1·10 inches. *Breadth* across maxilla (molars) 0·40″; behind infra-orbital foramen 0·25″, anterior to brain case 0·26″, external to glenoid fossæ 0·48″; external to tympanic 0·55″. Length of upper alveolar line 0·58″. Condyle of lower jaw to anterior end of alveolar line 0·60″ (*Anderson, J.A.S.B.*)

Hab.—Sind (Kurrachee, Kotree, Sehwan). At Kurrachee it affects drains and enters houses at night. Its presence is readily known by a sharp shrill cry it makes on first moving from any place at which

it had stopped in its rambles or when disturbed. Natives will not kill it, on account of a very popular notion that the musky odour emitted from the lateral glands is nauseous to snakes, and in consequence a deterrent to their entering the house. They feed on beetles, crickets, &c.

Family, ERINACEIDÆ,—Hedgehogs.

Upper parts covered with spines, lower with stiffish hairs and bristles intermixed. Feet pentadactylous; not fossorial. Tail very short or none.

Erinaceus, *Linn. Syst. Nat.* ed. xii. p. 75; *Mivart, Jour. Anat. Phys.* ii. p. 147.

Incisors $\frac{3-3}{3-3}$, pm. $\frac{4-4}{2-2}$, m. $\frac{3-3}{3-3}$. = 36 (*Owen.*) Incisors $\frac{3-3}{2-2}$, c. $\frac{1-1}{1-1}$, pm. $\frac{3-3}{2-2}$, m. $\frac{3-3}{3-3}$ (*Dobson. Anatomy of the Erinaceidæ P. Z. S.* 1881, p. 402.)

Upper middle incisors distant; lower ones procumbent. No true canines. Crown of molars square, tuberculate. Snout long. Ears moderate. Tail short. Body above covered with spines; spines grooved and ridged, the ridges in some species minutely tuberculate.

The number of species of this genus has been recently increased by the investigations of Dr. J. Anderson, F. Z. S., &c., Superintendent of the Indian Museum and Professor of Comparative Anatomy, Calcutta Medical College. Up to the time of the publication of a revision of the species by Dr. Anderson in the *Journ. As. Socy., Bengal, Vol.* xlvii, *Part* ii., 1878, two species were only known within the limits of India, recognized by Dr. Jerdon (Mammals of India) as *Erinaceus collaris*, Gray, and *Erinaceus micropus*, Blyth, and distinguished by him as the North Indian and South Indian Hedgehogs. Dr. Anderson also notices several other species which were described before the publication of Dr. Jerdon's Mammals of India as belonging to the Indian and Himalayan fauna,—but these have necessarily, after careful analysis of a large series of specimens from authentic localities, been incorporated as synonyms of the four admitted good species and referred to two distinct groups. Of these four species *E. pictus*, *E. Grayi* and *E. Jerdonii* inhabit Sind, the fourth *E. micropus*, before identified as a Sind species, is now found to be confined to Southern India.

The three species, found in Sind, come under the following of Dr. Anderson's groups:—

A. Second upper premolar simple, one-fanged.

a. Feet club-shaped, soles tubercular.

I. A division or bare area on the vertex.

A perfect malar bone; a brown band through the eyes and only very rarely prolonged on to the neck, stopping at the angle of the mouth. Spines yellowish, white at the apex, with a succeeding rather pale

brown band, the rest yellowish white. Ears round, moderately large. Limbs brown, under surface yellowish white. . . . . *E. pictus.*

B. SECOND UPPER PREMOLAR COMPOUND, THREE-FANGED.

b. Feet well developed and broad.

II. No division or bare area on vertex.

No large mesial pad on the hind foot. Head elongated and muzzle long. Ears large, high and pointed. General color dark brown. . . . . *E. Grayi.*

III. A division on the vertex, separating the spines into two groups.

Hind foot with a large prominent mesial pad. Muzzle moderately long. Ears large, rounded at the tip and broad at the base. Spines long, with two white and three black bands in the adult. General color black above and below. . . . . *E. Jerdoni.*

The following are Dr. Anderson's descriptions of these species in detail.

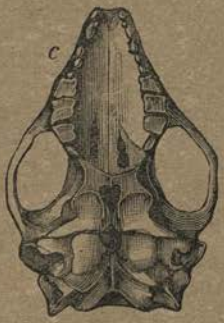
Erinaceus pictus, *Stol. Journ. Asiatic Soc. Bengal*, 1872, p. 223; *Anderson, J. A. S. B.* vol. xlvii. p. 195; *Murray, Hdbk., Zool., &c., Sind*, p. 73; *Dobson, Monog. Insect.* pt. i. p. 13.

PLATE III.

Head (fig. *d.*) short and broad. Ears (fig. *g.*) somewhat large and longer than the muzzle; feet (*c* to *f*) narrow, small. Toes short. The tail short with a nude area above it. Spines short, about 0·8″ in length, with 20-22 finely tuberculated ridges, their tips broadly white, and the brown bands below not very dark. The result is that the latter are nearly obscured by the former. The remaining are pale yellowish, nearly white and not orange. There is no continuation of the brown band of the forehead lower than the angle of the mouth, except as a very rare circumstance. Spines on the head divided by a nude median area. Forehead, neck, breast and sides of the body covered with yellowish white fur, less close on the abdomen. Rump, tail, fore and hind limbs and sides of the face brown.

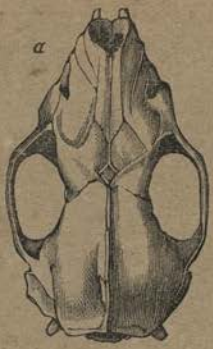
		Male.		Female.		
Length of head and body. ...	In.	6·70	6·00	5·85	5·90	4·73
,, ,, tail	,,	0·68	0·68	0·55	0·53	0·58
Height of ear	,,	1·33	1·23	1·03	1·21	0·85
Breadth of ear	,,	0·86	0·88	0·70	0·81	0·61
Snout to eye	,,	0·88	0·80	0·88	0·95	0·73
Eye to ear	,,	0·39	0·35	0·30	0·30	0·25
Length of hind foot without claws	,,	1·10	1·12	1·10	1·10	0·95
Breadth across 5th toe	,,	9·35	0·30	0·25	0·35	0·30

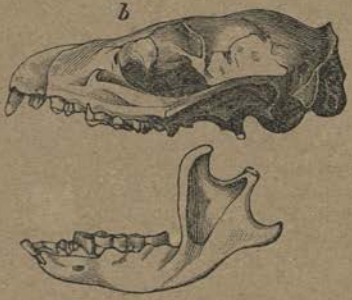
The skull (figs. *a* to *c*) is distinguished by its shortness and great zygomatic breadth, in which respects it differs from the skulls of all other Asiatic hedgehogs, and by its one-fanged, small, simple, second premolar placed out of the line of the teeth and by the rather marked post-orbital contraction.

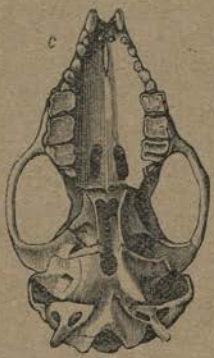


ERINACEUS PICTUS, *Stoliczka*.

a.—Upper view of skull. *b*.—Side view of skull. *c*.—Skull seen from below. *d*.—Side view of head. *e*.—Upper and under aspects of hind foot. *f*.—Fore foot seen from above and from below. *g*.—Side view of ear. *h*.—Side view of tail. All drawn natural size.







ERINACEUS GRAYI, *Bennett.*

a.—Upper view of skull. *b.*—Side view of skull. *c.*—Skull seen from below. *d.*—Side view of head. *e.*—Upper and under aspects of hind foot. *f.*—Fore foot seen from above and from below. *g.*—Side view of ear. *h.*—Side view of tail. All drawn natural size.

According to Dr. Anderson "this form was first described by Hutton as a probable variety of certain hedgehogs which he doubtfully regarded as *E. collaris*, which two of them appear to have been, but this third specimen, however, was *E. pictus*. *E. micropus* has diverged from the ordinary character of the genus more than any other Indian hedgehog, as is evinced by the absence of the malar and in the excessively rudimentary character of its second premolar, and these modifications occurring in the most southern outlier of a Palæartic type are note-worthy."

Hab.—Sind (Kurrachee), Kutch, Rajpootana, Jeysulmeer, Agra, Guzerat, Ulwar and Goona

Erinaceus Grayi, *Bennet, P. Z. S.* 1832, p. 124. Erinaceus collaris, *Gray, Ill. Ind. Zool.* vol. i., 1872. (not described): *id. List, Mam. B. M.* 1843, p. 81. *partim*: *Hutton, Journ. As. Soc. Bengal*, vol. xiv. 1845, p. 351. (first two specimens only); *Blyth, op. cit.* vol. xv. 1846, p. 170; *id. op. cit.* vol. xxii. 1853, p. 582, *partim*; *Wagner, Schreber Saugeth, Suppl.* vol. v. 1856, p. 590; *Stoliczka, Journ. As. Soc.*, vol. xli. 1872, p. 225; *Anderson, J. A. S. B.* xlvii. p. 195; *Murray, Hdbk., Zool., &c., Sind*, p. 73; *Dobson, Monog. Insectivora*, pt. i. p. 17.

PLATE IV.

Facial portion of head pointed and rather long (fig. *d.*). Ear, (fig. *g.*) large, full, long, and somewhat pointed. Feet (fig. *e.* and *g.*) large, forefeet rather broad and somewhat truncated, with moderately long toes and powerful claws. The proximal palmar pads forming a pair, and not very prominent. The hind feet with the toes turned inwards, the fingers moderately long and with strong claws. The proximal pad of the sole internal to the first toe, which is strongly developed as a mesial pad in *E. Jerdoni*, is practically absent in this species, so little is it developed. The tail (fig. *h.*) is moderately long and shortly haired; no bare space on the vertex. The spines begin slightly behind the anterior margin of the ear, and they are generally about 0·75″ long. The longitudinal grooves are numerous and shallow, but broader than the ridges, which are 25 to 26 in number, and studded with small tubercles. The spines are very narrowly tipped with black, and below this there is a very narrow yellowish band succeeded by a broad dark brown, almost black band, the remainder of each spine being yellow, except at its extreme base, which is dusky. The broad dark brown band below the yellow subapical band is so strongly developed, that when the animal is viewed from the side with the spines directed outwards, it has a black appearance. There is however considerable variation in the intensity to which the yellow subapical band is developed, and some animals are therefore much lighter coloured than others, as the brown band succeeding the latter is also much paler in some individuals than in others.

This species, besides the almost entire absence of the proximal mesial pad of the sole, is at once distinguished by the complete absence of the bare space that occurs in *E. pictus* and *E. micropus*, among the spines of the vertex. From the two last named species which have no large proximal pad on the sole, it is recognized by its large feet, well developed toes, powerful claws, and by the turning in of the hind feet,

as well as by its different colouration. There is a considerable naked space over the sacrum and on the dorsum of the tail as in other species. The snout is seminude, being sparsely covered by very minute hairs. Behind the whiskers, the hairs become much more numerous and larger, and the area below the eye and the forehead are well clad. The greater part of the front of the ear is nude, but there is a sprinkling of short white hairs internal to and along its margins. The chin and below the lower lips are almost naked, and, immediately behind the chin, the hairs are few. The under parts are well clad, but not densely so, and the limbs are thinly clad, more especially the feet, on which the hairs are very few and short. The tail also is only sparsely clothed.

The general colour of the animal is blackish-brown or brown, the spinous portion of the body being darkest. The front of the face, from the nose backwards to the spines, the limbs and all the underparts, with the exception of the chin and a line from it upwards to the ear, which are white, are generally dark-brown or fuliginous-brown, blackish on the face, on which there is occasionally a considerable intermixture of white hairs. The hairs which clothe the ears, and a tuft of hairs at the base of the anterior margin of the ears are white. The white on the chin is more prolonged upwards to the ears in some specimens than in others, giving rise to a kind of white collar which is much exaggerated in the figure of *E. collaris*. The claws are horny yellow.

The following are the measurements of this species :—

	Males.	Females.	
Length of body and head	6·85	6·70	6·70
„ „ tail	0·96	1·30	1·02
Height of ear	1·45	1·52	1·38
Breadth of ear	0·97	0·97	1·00
Snout to eye	1·00	0·49	0·62
Eye to ear	0·52	0·49	0·62
Length of hind foot without claws	1·45	1·45	1·50
Breadth of hind foot	0·40	0·45	0·38

Hab.—Sind, (Kurrachee), Rajpootana, Ajmeer and on the Sutlej.

Erinaceus Jerdoni, *Anderson, J. A. S. Bengal*, vol. xlvii. pt. ii. 1878, pl. v. *a.*; *Dobson, Monog. Insectivora*, pt. i. p. 16; *Murray, Hdbk., Zool., &c., Sind*, p. 80.

PLATE V.

Muzzle moderately long and pointed. Ears large, rounded at the tips and broad at the base. Feet large, more especially the forefeet, which are broad and powerful, with strong claws. The hind feet are well developed, but proportionately not so large as the forefeet. A large well developed pad on the under aspect of the hind foot. Claws strong. The tail moderately long. The spines begin on a line with the anterior margin of the ear divided on the vertex by a large nude area as in *E. micropus* and *E. pictus*. The spines are not very thick, and they are marked generally with 19 grooves and 19 ridges, the latter exceeding the breadth of the former and being very sharp, with the

ERINACEOUS JERDONI, *n.s.*

e.—Upper view of skull. *f.*—Side view. *g.*—Skull seen below. Natural size.

h.—Teeth of upper and lower jaws enlarged 2 diameters.

i. j.—Under aspect of fore and hind feet.

tubercles passing down on their sides almost into the hollow of the furrows. The animal is black when the spines lie flat, but when they are partially erected the white bands show, and a variegated appearance is produced. In the adult, with the spines 2·15″ in length, there are two white and three dark bands. The apical band is broad and deep shining black, and it is succeeded by a white band nearly of the same breadth, which is followed by a brown band with a white band below it, and then a dusky basal band. These are the characters of two females from Kurrachee.

The hair generally is dusky-brown, with an intermixture of grey hairs on the head and on the chin and throat; the fur behind the latter area and on the sides being paler brown than on the limbs, and on the sides. A patch of white hairs occurs at the base of the anterior angle of the ear; the inner surface of the ear is clad with short white hairs, and the apical third of the back of the organ with similar hairs. The moustaches are brown and reach behind the ear. The claws are yellow.

	Female.	Male.
Length of head and body	7·45″	5·85″
,, ,, tail	1·25″	0·91″
,, ,, hind foot without claws	1·48″	1·40″
Height of ear	1·40″	1·35″
Breadth of ear	0·76″	0·80″

The skull (figs. *e f g* Pl.) is markedly distinct from the short and especially broad skull of *E. Grayi*, and it has much smaller teeth than that species. The very prominent characters of the mesial pad on the hind foot, its larger ears and the presence of a large nude area on the vertex as in *E. micropus* and *E. pictus*, are characters along with those already indicated, separating it from *E. Grayi*. It resembles *E. niger*, in having a bare mesial area on the vertex, but is distinguished from that form by its smaller ear, and by its cranial characters as well.

Hab.—"Kurrachee, and Rohri in Sind" and Rajanpore, Trans Indus.

ORDER,—FERÆ, *Linn.*

Incisors $\frac{6}{6}$, regular, erect; canines $\frac{1-1}{1-1}$, conical; molars $\frac{4-4}{3-3}$ forming a regular continuous series, largest in the middle. Feet clawed, thumb non-opposable; teats abdominal, 4 or more.

SUB-ORDER,—CARNIVORA.

Grinders of three distinct forms; premolars conical, separated from the hinder tubercular molars by a sharp-edged flesh tooth, bearing a tubercle on its inner side.

Family, FELIDÆ.

Tubercular grinders small and in the upper jaw only. Dental formula as in the Order. Flesh tooth three-lobed. Tongue covered with papillæ directed backwards, and somewhat recurved. Claws sheathed.

Tribe, FELINA,—True Cats.

Tigris, *Gray, P. Z. S.* 1867, p. 263; *Cat. Mam. Br. Mus.* p. 10.

Of large size, striated. Tail long. Pupils round. Whiskers spreading; other characters same as those of the family.

Tigris regalis, *Gray, P. Z. S.* 1867, p. 263; Felis tigris, *Linn. Jerdon, Mammals Ind.* p. 92; *Blanford, East. Pers.* p. 34; *Murray, Hdbk., Zool., &c., Sind*, p. 85. *Wagh*, Deccan; *Shehr*, Hind; *Tagh*, Tibet; *Babr*, Persian; *Sheenh*, Sind.—The Tiger.

Colour bright fawn, more or less tinged with rufous. A series of transverse black bands or bars on the sides of the head, neck and body, continued on the tail in the form of rings. Tip of tail black, under parts white; hair short, except on the sides of the head, where it is about 4 inches long. Head large and round, ears short, and at a great distance from each other. Cheeks with spreading whiskers. Pupils round. Skull 14—15 inches long.

Length—Variable, the average size of an adult male being from 9 to 9½ feet. Jerdon says that occasionally tigers are killed 10 feet in length, and perhaps an inch or two more—a statement borne out by several persons in the controversy in the "*Asian*" as to the length of tigers. The height of the tiger is seldom above four feet; 3·9 ft. being the most common.

Hab.—The Indian Peninsula, Malay Archipelago, and Central Asia. In the Indian Peninsula it is found in Sind, the Concans and Deccan, Guzerat, Rajpootana, Central and Southern India. Extends to Persia, in the Caspian Provinces, Mazandaran and Ghelan lying north to the Elburz mountains. These provinces, unlike the plateau of Persia, are covered with dense forests, and in them, Mr. Blanford says, the tiger ranges up to an elevation of 5,000 to 6,000 feet. China, Sumatra, Chinese Tartary and the Altaic mountains are other parts where it is found. Ferrier (Caravan Journeys) speaks of tigers N. W. of Herat.

In Sind, the tiger happily is not common. It is found in the Khyrpoor State, but there are not many records of its causing destruction. In Lower Sind nothing is heard of it. From Sukkur upwards it is said to occasionally issue from its cover, which is the dense fringe of Tamarisk bushes and long grass along the banks of the river, visit the cultivated parts and carry away stray cattle. In Southern India, according to Mr. Walter Elliot, and also in Central India and Khandeish, tigers are the dread of the inhabitants, and almost a scourge, especially in Khandeish in the Malligaum districts, where they are known to carry off inhabitants out of the villages whilst sleeping in their verandahs during the night. The tiger seems to have no other instinct but a constant thirst for blood, a blind fury, which, as Burroughs says, knows no bounds or distinction, and often stimulates him to devour his own young, and to tear the mother in pieces for endeavouring to defend them. He generally lies in wait on the banks of rivers, where animals repair for drink, and the bound with which he throws himself on his prey is as wonderful in its extent

as it is terrible in its effects. Pennant observes that the distance which the tiger clears in this deadly leap is scarcely credible. In killing large animals, as a horse or buffalo, he seldom tears out the entrails at once, but to prevent interruption drags off the whole carcass to the forest or wood. Neither force, restraint, nor kindness can tame the tiger. Various devices are practised for the destruction of the animal in India, and, except of late, strychnine, which has been used to some purpose, spring bows, box traps, and hunting excursions have done but little towards annihilating it. When once a tiger takes to killing man, Jerdon says, it almost always endeavours to get the same food, being probably easier prey. The tiger is an emblem of power in India. Hyder Ally and Tippoo Sahib had troops, called tiger-soldiers, and the chief ornament of the throne was a tiger's head gorgeous with jewels.

Leopardus, *Gray, P. Z. S.* 1867, p. 363.—Of moderate size; tail long, body spotted simply or in the form of rosettes. Pupil round. Orbit of the skull incomplete behind.

Leopardus pardus, *Gray, P. Z. S.* 1867; *Jerdon, Mam. of India*, p. 97; *Murray, Hdbk., Zool., &c., Sind; Gray, Cat. Mam. Br. Mus.* Felis leopardus, *F. varia, et F. uncia, Schreb.*—The Pard or Panther.

Colour of the fur deep yellowish fulvous or rufous fawn, with dark spots grouped in rosettes, or several spots partially united into a circular, quadrangular or triangular figure in some skins; the spots from 12 to 14 lines in diameter. There are also several isolated dark spots on the outside of the limbs. Tail as long as the head and body, its extremity when turned back reaching to the tip of the nose, or in some a little less. Skull 9·25″ to 9·5″ × 5·62″ wide.

Whether the panther and pard or leopard so called are distinct species is a point yet to be settled. The vernacular names for both animals appear the same, "Chita" being applied indiscriminately to both, and is the most common name by which they are known. Mr. Sterndale, in the "*Asian*" (Popular Histroy of Mammalia, &c.) considers them distinct, and proposes the name of "*Felis Panthera*," a name already assigned by Schreb to the South American Jaguar, (*Leopardus onca, Linn. Gray P. Z. S.* 1867,) and by Erxl. to the Thibetan Ounce, *Uncia urbis, Gray. P. Z. S.* 1867. Cuvier separates the panther from the leopard specifically. The panther "*La Panthere*" he makes the *Felis pardus* of Linnæus, and the *Pardalis, ἡ* Πάρδαλις of the ancients. The panther he describes as yellow above, white beneath, with 6 or 7 rows of black spots in the form of roses, *i.e.*, an assemblage of five or six small simple spots on each side. The tail of the length of the body *not including the head. Felis Leopardus*, Cuvier says, is similar to the panther, but with ten rows of smaller spots. Temminck once regarded the panther and leopard as varieties of the one species, *Felis Leopardus*, but in his monograph he has separated them specifically. Bennett and Swainson (1838) touched upon the subject without coming to any decided conclusion. Major Hamilton Smith (*in Griff.*) says that "the open spots which mark all the panthers have the inner

surface of the annuli or rings more fulvous than the general colour of the sides; but in the leopard no such distinction appears, nor is there room, as the small and more congregated dots are too close to admit it." Gray (*Cat. Mam. Br. Mus.* 1869) also does not separate the pard and the panther specifically, and as synonyms of *Leopardus pardus* gives, besides those above, *Felis panthera*, Erxl., *Felis chalybeate*, Herms., *Felis minor*, Ehr., *Felis antiquorum*, Fischer., *F. Pœcilura*, Valenc., *Felis paleopardus*, Fitz., *Var black. F. melas*, Peron. If, however, it is found that the characters of the length of the tail, and number of caudal vertebræ (22) in the panther, (instead of 28 as in the leopard) is constant, it would certainly be entitled to specific separation.

Hab.—The Indian Peninsula, Beloochistan, Persia, N.-W. Provinces and Bengal, and in fact throughout India, and North, South and West Africa. In Sind it is found, but is not common, and with the hunting leopard, affects the hills approaching the Indus, where both prey on the gazelle or ravine deer. Of the two, this species is said to be the dread of the cultivators, as, unlike the hunting leopard, it is often found hiding during the day in high *jowaree* fields, while the hunting leopard seldom emerges from its hilly retreat. "Every where," says Mr. Blyth, "it is a fearful foe to the canine races," and Jerdon states it does not confine itself to the forests, but prowls among villages carrying off sheep, goats, and dogs, and sometimes commits great depredations. On the hills in Sind, Lus Beyla, and in Beloochistan, the inhabitants usually go leopard hunting, not with fowling pieces, but with large heavy clubs, twenty or thirty of them surrounding and beating the animal to death.

Felis, *Gray, P. Z. S.* 1867.—Of small size generally. Tail as long as the body, sometimes shorter. Ears rounded at the tip, not pencilled with long hairs. Pupil linear. Orbits generally large. Skull moderate, rather ovate; brain case oblong, moderate.

Felis viverrina, *Bennet, P. Z. S.* 1883, p. 60; *Jerdon, Mammals of Ind.*, p. 103; *Murray, Hdbk., Zool., &c., Sind.* Felis viverriceps, *Hodgs.* Viverriceps Bennetti, *Gray, P. Z. S.* 1867, p. 268, fig. 5; *Cat. Mam. Br. Mus.* 16.—THE LARGE TIGER CAT.

Head rather elongate; ears rounded, not pencilled; cheeks white; a black face stripe. Colour greyish or dark grey, tinged somewhat tawny, with large dark spots more or less numerous, oblong on the back and neck, and in lines more or less broken or coalescing on other parts of the body. Beneath dull white, chest with 5—6 dark bands. Belly spotted. Tail with 6—7 dark bands and a black tip. Feet unspotted. Eyes nocturnal. Pupil erect, linear. Skull elongate; face produced, concave on the sides in front of the orbits, which are large and complete behind. Canines conical.

Hab.—Not uncommon along the tamarisk fringed banks of the Indus. Found also throughout Bengal up to the foot of the Himalayas, extending into Burmah and China. Common in Travancore, Ceylon and the Malabar Coast.

Tail shorter than the body; ears pencilled at the tip.

Felis ornata, *Gray, Illust. Ind. Zool.; P. Z. S.* 1867, p. 401; *Jerdon, Mam. of Ind.*, p. 110; *Murray, Hdbk., Zool., &c., Sind*, p. 86. Felis torquata, *Gray, Jerd. Mam. Ind.*, p. 110. Chaus ornatus, *Gray, P. Z. S.* 1867, p. 275; *Cat. Mam. Br. Mus.*, p. 35.—THE SPOTTED WILD CAT.

Fur short, pale yellowish, more or less fulvescent, or grayish fulvous, with numerous small black roundish spots, linear on the middle of the back, head, nape and shoulders; and on the hinder part of the sides small and round; on the thighs and upper part of the legs, confluent, forming interrupted bands. One or two black streaks within the arm. Tail reaching to or below the heel, with a well-defined series of black rings. Tip black. Ears externally dull rufous, with a very small dusky pencil tuft. Crown with lines of small spots. Cheeks striped with two narrow dark lines. Chin, throat and spot over the eyes whitish. Belly with or without a few spots.

Length.—Head and body 19 inches, tail 8 inches or more.

Common nearly throughout the Province, in gardens, grass thickets, &c., and occasionally on the river banks. It does much mischief in poultry yards, and has been known to carry away rabbits insecurely penned. Commonly its chief food consists of field rats, and such game as it can secure among birds.

Hab.—Sind, Kutch, the Punjab Salt Range, and Hazara; has also been found in Central India.

Felis chaus, *Güldenst; Jerd. Mam. Ind.*, p. 111; *Murray, Hdbk., Zool., &c., Sind*, p. 86. Felis Jacquemonti, *Is. Geof. Voy. Jacq.* t. 3 f. 1-2. Chaus Jacquemonti, *Gray, Cat. Mam. Br. M.*, p. 34. Chaus libycus, *Gray, P. Z. S.* 1867, p. 275. *Mohta Rahn Manjur*, Deccan; *Jung-billee*, Sind.—THE COMMON JUNGLE CAT.

Colour of fur dirty palish ochre-yellow, darker on the back and lighter on the under parts; the hairs or bristles are of the same colour at bottom, have a dark brown ring in the middle, and at the tip are of a grayish yellow, whitish or saffron colour, so that the appearance produced is a mixed colouring of grayish yellow and dirty white. Many of the hairs have a black tip, and on the sides, where they are close-set, they form pale black perpendicular or oblique spiral lines, and here and there single black points. The hairs of the back are of a light ochre-yellow, with points almost of a saffron colour, and form from the shoulders to the tail a yellow stripe, which is darkest on the cross. The nose is black; above the eye is a large white spot, and below it a smaller one. A black streak from the eye to the muzzle. Edges of the lip bordered with black, and a fine white ring encircles them; eye-brows and cheek, whitish. Inner surface of ear, towards its outside, bordered by yellowish white hair; back of the ear grey brown or rufous brown, with terminating black tufts from $\frac{1}{4}$ to $\frac{1}{2}$ inch long. Cheeks, lower jaw, throat, neck and chest ochreous yellow; the belly much paler, inclining to whitish yellow. Limbs with four more or less distinct dark stripes externally, and two or three internally.

Tail short, about one-fourth the length of the body, more or less distinctly annulated and tipped black.

Length.—Head and body 26 inches, of which the tail is from 6″ to 10″; height 14—15 inches.

Hab.—Sind, haunting the marshes. Occurs also in the Punjab Salt Range, and commonly all over India, from the Himalayas to Cape Comorin. It is a native of North-Africa. Said to be numerous in Persia and Mesopotamia.

Tribe, LYNCINA,—True Lynxes.

Head short, globular; hind legs longest, in *caracal* more equal; tail short; ears pencilled at the tip; pupils oblong, orbits incomplete, large, the lateral processes of the intermaxillæ and frontal bones elongate, nearly reaching each other, (in *caracal* not so much produced), and the limbs are nearly equal. Lobe on inner side of upper flesh tooth small.

Felis caracal, *Schreb. Blainv. Osteol. Felis*, t. 10; *Jerd. Mam. Ind.*, p. 113; *Murray, Hdbk., Zool., &c., Sind.* Caracal melanotis, *Gray, P. Z. S.* 1867, p. 277; *Cat. Mam. Br. Mus.*, p. 38. *Siahgosh*, Hind. Sind, Pers.—The Red Lynx.

Fur pale reddish brown with a vinous tinge, paler or nearly white beneath. Two spots of pure white above the eyes, the uppermost on the inner side of the eye, the lower at the external angle at the origin of the moustaches. Edges of the upper lip, chin, breast and inside of the legs white; parts whence the whiskers spring, black. Ears deep black at the base externally, and less so towards the tips, which are pencilled with a long black tuft.

Length—30—36 inches, tail 9″ or 10,″ ear 3,″ height 16 to 18 inches.

Hab.—Sind, Punjab, Kutch, Guzerat, Travancore, Northern Circars, Bengal, Central India, Rajpootana and Khandeish, also in Persia, Arabia, and Africa.

According to Temminck this species hunts in packs like the wild dog and so runs down its prey. Lynxes are often tamed and trained in the chase of peacocks, cranes, and the lesser quadrupeds.

Family, GUEPARDIDÆ.

Head short, face short, neck slightly maned. Legs slender, subequal. Tail long. Ears rounded. Skull short, convex. Processes of intermaxillæ and frontals also short, not separating the nasals. *Flesh tooth of upper jaw compressed, not lobed internally.* Front upper small grinder distinct; small tubercular grinders one on each side of the upper jaw.

Gueparda.—Characters those of the Family.

Gueparda guttata, *Gray, P. Z. S.* 1867, p. 396. Felis jubata, *Schreb. Jerd. Mam. Ind.*, p. 114; *Murray, Hdbk., Zool., &c., Sind*, p. 86. Felis guttata, *Herm.* F. venatica, *A. Smith.* Cynælurus Sœmmeringii, *Rupp.*—The Hunting Leopard or Cheeta of India.

Fur bright yellowish fawn above; nearly pure white beneath; covered above and on the sides with numerous closely approximating black spots, ½ to 1 inch in diameter, but not grouped in rosettes. A black streak from the corner of each eye down the face; chest and under parts of the body unspotted. The spots on the back are larger than those on the head, sides and limbs, where they are more closely set. Ears short and rounded, with a broad black spot at the base externally; the tip and inner side of the ear whitish; extremity of the nose black. Tail with black spots and the tip black, (tip white, *Bennett*). Mane not very considerable, pupil circular.

Length.—Head and body 4·5—5 feet, tail 30 inches, height nearly three feet.

Hab.—The hunting leopard is found nearly throughout India, in Sind, Rajpootana, the Punjab, Central, Southern and N. W. India, also Syria, Mesopotamia, Arabia and Africa.

The employment of the cheetah in the chase of antelopes, &c., is so well-known, that it is scarcely necessary to give a description of it. The skin of all the leopards, and of the tiger also, is an article of some importance in the trade.

Family, MUSTELIDÆ.

Sub Family, LUTRINA,—Otters.

Head depressed; feet normal, subdigitigrade; toes webbed; tail thick, tapering, depressed; teeth normal; flesh tooth acutely tubercular; large tubercular grinder, oblong; nose convex, hairy beneath.

Lutra, *Ray.*—Characters those of the Sub Family.

Dentition: Incisors $\frac{3-3}{3-3}$; canines $\frac{1-1}{1-1}$; premolars $\frac{4-4}{3-3}$; molars $\frac{1-1}{2-2}$.

Lutra nair, *F. Cuv.; Jerd. Mam. Ind.* p. 86; *Murray, Hdbk., Zool., &c., Sind,* p. 85. Lutra Indica, *Gray, Lond. Mag. Nat. Hist.* 1837, p. 580; *P. Z. S.* 1865, p. 128; *Cat. Mam. Br. Mus.,* p. 104. *Loodra,* Sind.—The Common Indian Otter.

Muzzle bald, square. Fur above hair brown, or light chestnut brown, in some grizzled with white hairs, in others tinged with isabelline yellow. Beneath, the fur is short, of a yellowish white or reddish white colour. Upper lip, sides of head, and neck, chin, and throat whitish. Paws albescent. In some the tip of the tail is white.

Length.—3½ to 4 feet, of which the tail is 1½ feet or more, the width at the base being 3 to 3½ inches.

The otter is found in great numbers along the Indus to the Punjab. Most of the Mohanas or fishermen have always two or more of these animals as an essential to their avocation to drive fish into their nets. This they are trained to do. In porpoise catching this animal is also of great service to the fishermen. When the boats, which are the homes of the fishermen, are lying at the banks as many as 20 or 30, otters may be seen tied round the waist, tethered to stakes by the

edge of the water, some lying half in and half out of the water, and others rolling about in the sand: dogs and children playing with them.

Hab.—According to Jerdon it is found throughout all India, from the extreme south of Ceylon to the Himalayas, and from the Indus to Burmah and Malayana, affecting both fresh and salt water inlets.

Family, MELINIDÆ.

Head moderate, elongate. Nose simple, flat and bald beneath, with a central longitudinal groove. Tubercular grinders, one on each side of the upper and lower jaws. Claws large, spread out. Ears small or rudimentary. Most of the animals comprised in this group have the power of diffusing a fœtid stench.

Sub Family, MELLIVORINA,—Badgers.

Tubercular grinders transverse, band-like, palate only slightly produced behind. Flesh tooth with a small internal lobe, with a single tubercle. Fur black below, white above.

Mellivora, *Bl.*—Head depressed. Nose blunt. Ears distinct. Body stout. Legs short, plantigrade. Toes 5-5. Claws long and strong. Tail short, subcylindrical. Sole of hind foot bald.

Mellivora Indica, *Bl. Osteogr. Mustela; Gray, P. Z. S.* 1865, p. 103; *Cat. Br. Mus.*, p. 132; *Jerdon, Mam. India*, p. 78; *Murray, Hdbk., Zool., &c., Sind. Bijoo* and *Gorepat* of the Sindees.—The Indian Badger.

Above tawny white or grey, black on the sides and beneath. Tail short. Skull elongate, ovate. Nose short, concave on the sides, flat above. Orbits incomplete. Four middle cutting teeth equal; the side ones conical and with a recurved tip. Canines conical. Flesh tooth of lower jaw with three conical tubercles in a single longitudinal series.

Length.—Head and body 30 inches, tail 6″.

Hab.—Sind, the Punjab, Deccan, Kutch, Guzerat and throughout India, everywhere having the reputation of being a grave digger.

Family, HERPESTIDÆ,—Mongooses.

Body elongate. Tubercular grinders two on each side in the upper and one in the under jaw. Nose flat and bald beneath, with a central longitudinal groove. Hind feet slender, their under side bald or more or less covered with scattered hairs; toes slender, legs short. Fur harsh grizzled. Orbits of the skull complete. Toes 5-5. Claws short.

Herpestes, *Illiger.*—Toes 5-5. Tail conical, covered with long hairs. Pupil linear, erect. Teeth 40; false grinders $\frac{3-3}{4-4}$; tubercular grinders transverse.

All the species of this genus are noted for their natural antipathy to serpents, and for committing havoc among poultry. They are however excellent ratters. The question of the mongoose neutralizing the poison of the bite of serpents by eating the root of some plant, still remains unsolved.

Herpestes griseus, *Desm. Mam.* p. 212; *Gray, P. Z. S.* 1864, p. 553; *Cat. Mam. Br. Mus.* p. 151; *Jerd. Mam. India*, p. 132; *Murray, Hdbk., Zool., &c., Sind*, p. 88. H. pallidus, *Schinz. Syn. Mam.* 1, p. 373. Mangusta grisea, *Fischer, Syn. Mam.* p. 164. *Newera, Nayria, Nore*, Sind.—THE MADRAS MONGOOSE.

Tawny yellowish grey or pale grey, the hairs harsh, ringed with rufous and yellowish, with a broad white or yellowish subterminal ring. Feet blackish. Tail bushy, concolorous with the body, not tipped black, and nearly equal in length to the body. Cheeks and throat more or less reddish. False grinders 3—3, the first is conical, roundish; the third triangular. Flesh tooth longer than broad in front. Tubercular grinders transverse. Lower jaw shelving in front. Skull, length 2·75 inches, width at zygomatic arch 1·42″.

Length.—Head and body 16-17 inches, tail 14″.

Hab.—Sind, Punjab, Kutch, Guzerat, Deccan and Concan, Bengal, Travancore, Nepal and India generally. In Southern and Central India very common.

Affects scrubby jungle in Sind. In villages, it is very destructive to poultry.

Herpestes persicus, *Gray, P. Z. S.* 1864, p. 554; *id. Cat. Carn. Br. Mus.* p. 151; *Blanf. Eastern Persia*, p. 42; *Murray, Hdbk., Zool., &c., Sind*, p. 88.—THE PERSIAN OR GREY MONGOOSE.

Pale ashy, very closely and abundantly black and white punctulated; hair short and soft, ringed black and white, one dark band at the base, one in the middle and the third at the tip, the interspaces being white. Chin and under side uniform ashy, brownish on the chest. Tail conical, concolorous with the back. Feet like the back with shorter fur, chiefly tipped white. In general appearance a miniature of *H. griseus*.

Length.—Head and body 10—12 inches; tail 10½—12 inches, skull rather elongate, 2·4 to 2·6 inches in length; teeth normal, the third false grinder subtriangular, with a small central prominent lobe. Flesh tooth subtrigonal, the inner tubercle small on the front edge. Width at zygomatic arch 1·3″, of brain case 1·1″. Forehead convex. Contraction behind orbit ·62″.

Hab.—Sind and Persia. Habits same as *H. griseus*.

Herpestes ferrugineus, *Blanford, P. Z. S.* 1874, p. 661, pl. lxxxi; *Murray, Hdbk., Zool., &c., Sind.*—THE FERRUGINOUS MONGOOSE.

General colour ferruginous, minutely speckled and mixed with white. Fur moderately fine. Hairs of the back long, dull rufescent at the base, and the remaining portion composed of short alternating rings of white and ferruginous, there being sometimes as many as six alternations in each hair, the extreme tips being ferruginous. On the lower parts the colour is a little paler, and the rings on the hairs are less distinct; upper portions of the feet rather darker red; soles of feet and lower part of tarsus bare. The hair on the tail is long and the

white rings on the hairs gradually disappear backward, the tip being entirely red. Dimensions (from a dried skin and in consequence only approximate) head and body 15 inches; tail (vertebræ not preserved) to end of hairs the same.—(Three specimens in the Kurrachee Museum, measured in the flesh are each half an inch longer both in the length of the head and body, and tail). The hairs on the hinder part of the back are fully $1\frac{3}{4}$ inch long. Tarsus and hind foot to end of claw 2·8 inches.

Mr. Blanford adds that "in general form this mongoose closely resembles *H. griseus*, Geoffr., so much so, that he was at first doubtful whether it was more than a rufous variety of it. But not only is the colour very distinct, but the skull shows some important differences. The orbit is incomplete behind; this is certainly the case in the young of *H. griseus*, but not to the same extent as in *H. ferrugineus*. The nasal bones are longer in *H. griseus*, their posterior termination being behind a line connecting the anterior edges of the orbits in the skull; whereas in this new species the nasals terminate posteriorly in front of the same line. The breadth across the frontal region, immediately behind the post-orbital processes, is considerably less in *H. griseus*, and the auditory bullæ are differently shaped."

The skull extracted from the skin of *H. ferrugineus* measures—

	Inches.
Length from upper edge of foramen magnum to anterior termination of intermaxillary bone	2·7
Left nasal bones along the suture between them	0·54
Breadth of frontal region where narrowest behind post-orbital process	0·62
Length of lower jaw from the angles to the anterior alveolar margin	1·85

Hab.—Sind, (Larkhana, Kotree and Kurrachee).

Herpestes, *Andersoni*, *Sp. Nov.*—Chin, throat, breast and under parts ferruginous, slightly paler on the abdomen. A dark line running from the front of each eye towards the nose, but separated from it by a small ferruginous interspace. Upper series of long moustaches as well as the group of hairs above the orbits black. Forehead darker ferruginous than the lower parts, the hairs being white basally, then black, followed by a subapical ferruginous band and tipped with dusky. The soft under-fur is long and woolly, basally yellowish white, and tipped with pale ferruginous. The hairs on the back are grizzled by tricoloured annulations of white, black and ferruginous; basally the longer hairs are dusky, followed by 3 white and 3 black bands and a subapical ferruginous band, the tips being black. Apical band of the shorter hairs is ferruginous. Ears oblique, covered in front on their inner margins with ferruginous hairs, darker and shorter behind. Feet dark rufous brown, blackish on the toes, where the hairs are broadly tipped with black. Claws black. Tail less grizzled, only a few scattered hairs with black tips. Those on the base of the tail variously coloured, some with broad white bases and a single black

ring, others basally white and broadly tipped with rufescent, the interspace being white.

Length.—Of head and body (stuffed specimen) 19½ inches; tail 17½"; ear obliquely across, 1·25; from orifice ·93"; tarsus to tip of claw ·3"; length of skull 3·12", across zygomatic arches 1·69", length of brain case 1·69", width of ditto ·93", contraction behind orbit ·56". Lower jaw, from the angle to the anterior alveolar margin, 2·1"; orbit complete behind; sagittal crest linear; skull solid, sutures not apparent. Super-occipital crest terminates in a strong ridge 0·18" high, continued down to the bullæ auditoriæ.

A single specimen of this large species was obtained at Kotree. It is quite unlike any of the other species, both in colour and size, and the marked cranial characters appear to me to be sufficient to form a new species. I therefore provisionally name it after Dr. J. Anderson, Superintendent of the Indian Museum, who has very materially assisted me in this work.

Family 10, CANIDÆ,—The Dog Tribe.

Tubercular grinders two on each side of the upper and lower jaws. False grinders 2 or 3 on each side of each jaw; molars $\frac{6-6}{7-7}$, more rarely $\frac{7-7}{7-7}$ or $\frac{8-8}{8-8}$. Toes 5—5 straight, free, with worn-tipped claws, the front inner toe raised. Upper flesh tooth with one inner tubercle, lower with its posterior portion tuberculous.

Canis aureus, *Linn. Syst. Nat.* 1, p. 59; *Jerd. Mam. Ind.*, p. 136; *Gray, Cat. Mam. Br. Ind.*, 189; *Murray, Hdbk., Zool., &c., Sind. Tholuk* of the Mekranees; *Kola,* Hind; *Giddur,* Sind.—The Jackal.

Colour of fur variable. During winter, when in good fur, the muzzle is reddish or rufescent brown with a black patch in the centre, running up between and on the outside of the eyes; there is also a narrow dark streak running up from the hind edge of the eye to just below the ears, where there is a dense patch of rufescent brown hairs. The long moustachial hairs, the groups over the eyes, sides of face and behind the chin are black. The ears outside are pale rufous at the base, a little darker above near the tip and sprinkled with black hairs. There is also a patch of long greyish white hairs in the anterior upper corner of the ear; the inside of the ear is edged for about an inch all round with white hairs, and the extreme margins with very pale isabelline. The forehead is rufescent brown with some dark hairs intermixed. The chin is dark brown, except a very small patch, which is white just behind its anterior edge. The upper lip greyish white or white, continued behind and spreading behind the dark chin patch on the throat; sides of the neck and a collar filling up the interspace between the white of the throat and the chest, rufescent brown, with black hairs intermixed; neck above, back and sides of the body grizzled with black and white or rufescent hairs, and in all good specimens there is a saddle-shaped patch of black on the back. There is also a distinct black patch on the root of the tail; rest of the tail

having a grizzled appearance owing to the broad rufescent bases of the broadly black tipped hairs showing through; extreme tip of the tail black. Length of hairs from the tip of the tail 3 to 3½ inches.

The soft under-fur throughout the upper part of the body is dusky grey, except on the forehead, where it is much darker. The anterior two-thirds of the upper parts rufescent, the bases of the hairs being white. Abdomen white or greyish white, as also are the inner sides of the front and hind legs to the middle of the thighs, where, and running up behind the haunches and extending in front and down to the feet, it is rufescent, darker on the outside of the thighs. Front of forelimbs rufescent, with a mesial black line, not extending on the metacarpal portion of the limbs.

Length.—Head and body 30—32 inches, tail 10—12 inches, height at shoulder 16—17 inches.

Found throughout India. It hunts in packs and is the pest of all villages and cantonments, not only as a marauder, but for its unearthly howls in company with the hyæna. A cry raised by a single individual is taken up in chorus by the pack to which it belongs, and followed up in this way by other packs for a great distance. Jackals are however useful scavengers in camp, cantonment and village, and never being molested increase greatly in numbers annually; being however a prey to wolves, a great number may thus be exterminated. In the Narra districts, and also in Thurr and Parker there are many instances annually of deaths from hydrophobia caused by the bites of jackals. It is said that six hours is the most a person survives after the bite.

Canis pallipes, *Sykes, P. Z. S.* 1831, p. 101; *Gray, List Mam.* p. 58; *Jerdon, Mam. Ind.* p. 89; *Murray, Hdbk., Zool., &c.*, Sind, p. 89. Lupus pallipes, *Gray, P. Z. S.* 1868, p. 504; *Cat. Mam. Br. Mus.* p. 189. *Landgah*, Hind; *Buggyar*, Sind.—The Indian Wolf.

Colour variable. Hoary fulvous or dirty reddish white, some of the hairs tipped black. Face and limbs somewhat rufous. Lower parts dingy or soiled white; tail black tipped; ears small; coronal crest of skull linear, high; upper sectorial teeth large, elongate; mammæ 10. The colour of the Indian wolf varies much, both according to season and locality, more generally the fur is fulvous, or dun colour with scarcely any reddish or rufous tinge anywhere.

Length.—Head and body 35—40 inches, tail 15—17 inches, height 24—28 inches.

Hab.—Sind, also Kutch, the Deccan and Concan, Khandeish and throughout India nearly.

Vulpes,—Foxes.—Muzzle lengthened, acute. Temporal crests of the skull linear; ears large, erect; tail with soft fur, long and bushy, and reaching to the ground.

Vulpes Bengalensis, *Shaw, Zool.* i., p. 230; *Jerd. Mam. of Ind.* p. 149; *Gray, Cat. Mam. Br. Mus.* p. 204; *Murray, Hdbk., Zool., &c., Sind*, p. 90. *Lokree, Lookar, Loomur*, Sind; *Loomree*, Hind.—The Indian Fox.

Fur reddish grey or rufescent above and below; colour varying considerably seasonally; ears long, dark brown externally; tail long, bushy, tipped black; chin and throat whitish.

Length.—Head and body 21—22 inches; tail 12—14 inches.

Hab.—Sind, Punjab, Kutch, Guzerat, Deccan, Concan, and throughout India affecting the plains; burrowing usually in mounds. In Sind its chief food appears to be (from dissection of several examples) the berries of *Grewia* and *Zizyphus*, field rats and a large rock lizard, *Uromastix Hardwickii*.

Vulpes leucopus, *Blyth, J. A. S. B.* 1854, p. 729; *Jerd. Mam. Ind.* p. 151; *Gray, P. Z. S.* 1868, p. 516; *Cat. Mam. Brit. Mus.* p. 204; *Murray, Hdbk., Zool., &c. Sind.*—THE DESERT FOX.

Fur variable, general colour fulvous white mixed with darker brown or black. Face lighter in colour. Tail largely tipped with white. Lower parts nigrescent. Ears black posteriorly. Females usually with whitish limbs.

During winter the muzzle is fulvous white, the long moustachial hairs, and the groups above the eyes and behind the angle of the mouth are black; the fur is very variable. Forehead pale rufous, in some specimens bright rufous; sides of the face, chin and throat and the inner sides of the limbs fulvous white, a dark stripe running down from the corner of each eye to about the middle of the edge of the upper lip. Ears edged all round with fulvous white, externally they are blackish, with, in some specimens, a rufous tinge, the extreme margins fulvous white. Back and upper side of the tail and the outside of the limbs brighter rufescent than the forehead, with a large admixture of white, which colour is chiefly that of the apical rings on the back, while on the flanks, tail and sides of the neck there are more black than white apical rings. Under parts fulvous white, soles of the feet dusky brown. Tail largely tipped with white.

Hab.—Sind, Kutch, Rajpootana and the Punjab. Affects chiefly the sandy dunes and lives on field rats, &c., oftentimes associated with the next in Upper Sind.

Vulpes pusillus, *Blyth, J. A. S. B.* 1854, p. 729; *Gray, P. Z. S.* 1868, p. 517; *Cat. Mam. Br. Mus.* p. 205; *Jerd. Mam. Ind.* p. 153; *Murray, Hdbk., Zool., &c., Sind.*—THE SMALL PUNJAB FOX.

Fur variable. General colour pale fulvous, darker on the sides and lighter on the shoulders. Middle of back rufous. Tail greyish. Ears externally velvety black. A faint eye streak. Cheeks whitish. Tail white tipped.

Length.—24 inches; tail 14 inches.

Family, HYÆNIDÆ,—HYÆNAS.

Digitigrade carnivorous animals with their forelegs longer than their hind legs. Tongue rough. Molars or cutting teeth of great size, conical. Eyes projecting. Ears large. A deep subcaudal glandular pouch. Tubercular grinders single, in the upper jaw only.

Dentition. Inc. $\frac{6-6}{6-6}$, can. $\frac{1-1}{1-1}$, molar $\frac{5-5}{4-4}=34$.

Hyæna, *Linn.*—Tubercular grinders of upper jaw with three roots. Flesh tooth with three lobes; the front one large.

Hyæna striata, *Zimm. Geogr.* ii., p. 256; *Gray, P. Z. S.* 1868, p. 524; *Cat. Mam. Br. Mus.* p. 212; *Jerd. Mam. Ind.* p. 118; *Murray, Hdbk., Zool., &c., Sind,* p. 87. H. vulgaris, *Desm. Mam.* p. 215. Canis hyæna, *Linn. Syst.. Nat.* i, p. 58. *Thurruss, Cherrag,* Sind.—THE HYÆNA.

Colour variable, generally of a pale yellowish or uniform gray, rather paler beneath. Sides, shoulders, haunches, and outside of the legs striped irregularly blackish. Mane and tail also striped or spotted black. Front of the neck, muzzle and outside of the ears black; the latter broad, and nearly destitute of hairs, especially inside; mane on the back of the neck full, and continued, though less distinctly, along the back to the tail. On the back the stiffish hairs are 4—8 inches in length.

Hab.—The hyæna is found throughout India, affecting the hilly districts; also in Asia, Africa, the Caucasus, Persia, Beloochistan, Turkey, Syria, Senegal and the Cape. In India it is with the jackal a noisome pest.

It lives in holes in the ground, or cliffs of rocks, and preys by night, breaking like the wolf into sheep-folds, and attacking and carrying away dogs. It however has its place in the economy of nature, being a useful scavenger. It is said to possess the peculiar gift of being able in some measure to imitate the cries of other animals, by which means, dogs, calves, and sheep are beguiled. The ancients believed that it changed its sex, imitated the human voice also, and had the power of charming the shepherd, and as it were rivetting him to the place he stood on, and also dogs, so that they became dumb. The superstitious Arabs, according to Shaw, when they kill a hyæna, carefully bury the head, lest it should be applied to magical purposes. They also attribute preternatural powers to its remains.

It is said to manifest great attachment to its keeper when tamed, and to be susceptible of the same domestication as the dog.

Family, URSIDÆ,—BEARS.

Plantigrade mammals with normally $\frac{6}{6}$ incisors; canines $\frac{1-1}{1-1}$; premolars $\frac{4-4}{4-4}$; molars $\frac{2-2}{3-3}$. Two tuberculated teeth on each side in the upper jaw, and one or two in the lower jaw. Feet broad and short and generally callous below. Tail short. Nose rather produced.

Ursus, *Gray.*—Teeth as in the characters of the Family. False grinders or molars small, distant, often deciduous. Hinder tubercular molar large, elongate, larger than the flesh tooth.

Ursus tibetanus, *F. Cuv. Mam. Lithog.* t; *Jerdon, Mam. Ind.* p. 70; *Murray, Hdbk., Zool., &c., Sind.* Ursus torquatus, *Schinz. Syn. Mam.* p. 302; *Gray, P. Z. S.* 1864, p. 688; *Cat. Mam. Br. Mus.* p. 226. Helarctos malayanus, *Hodgson, J. A. S. B.* 1, p. 340. *Reench* or *Reech, Baloo,* Hind.; *Mumh,* Bel.; *Reech,* Sind.—THE INDIAN BLACK OR THIBETAN BEAR.

Fur black; lower lip and chin white. A broad forked white mark on the chest, rather contracted behind; cheeks with bushy hairs; face brownish; neck thick; head flattened; ears rather large; upper tubercular molar elongate, half as long again as the flesh tooth.

Hab.—The mountains of Sylhet and Nepaul, on the Himalayas, and the hill ranges of Assam from 5,000 to 12,000 feet, said to be rare in Thibet. Inhabits the hill ranges in Sind and Beloochistan, where probably it feeds on roots and the fruits of *Grewia*, &c., and honey.

It had long been maintained that a bear inhabited the hills of Sind and Beloochistan, but till Major Mockler, the Political Resident at Gwadur, obtained several skins on the hills near Mand, nothing positive was known as to its identity.

It is said to eat flesh occasionally, and Capt. Baldwin, in his "Large and Small Game of Bengal," mentions that it is not only a flesh eater, but also a foul feeder, having himself seen one make a meal off a bullock that had died of disease.

Fabulous stories as to the habits and propensities of this species for carrying away women and children are repeated by Beloochees.

ORDER, CETACEA,—THE WHALE TRIBE.

Aquatic mammals with anterior fin-like extremities, the posterior extremities absent. Body fish-shaped. Teeth all similar, conical, or dissimilar, ridged, sometimes not developed. Skin usually thick and devoid of hair; ribs much curved, and a very few joined to the sternum, which is short and wide. Two small bones suspended in the flesh near the anus are the only vestiges of posterior extremities; spiracle or blowhole, single or double. This order comprises the Families *Delphinidæ* (Porpoises) and *Balænidæ* (Whales).

Family, DELPHINIDÆ.—*Cuv.*

Head beaked; teeth numerous, conical in the whole length of the edge of both jaws; dorsal fin falcate, rarely wanting.

Delphinus.—Dorsal distinct, medial; rostrum narrow, continued abruptly from the forehead; teeth 24—60 on each side, above and below.

Delphinus plumbeus, *Duss; Jerdon, Ind., Mam.* p. 157. Steno malayanus, *Less. Voy. Cog.* t. 9 fig. 5; *Gray, Zool., Ereb. and Terror,* 43; *Cat. Cetac. Br. Mus.* 232. D. Capensis, *Rapp. Cetac.* t. 2 *f. l.* (not *Gray* nor *Cuv.*)—THE PLUMBEOUS DOLPHIN.

Of an uniform grey, ash or leaden colour. Teeth $\frac{36}{36}$.

Length—6—8 feet.

Hab.—Sind, Cutch, and Malabar Coasts.

Delphinus longirostris, *Gray, Spic. Zool.* i; *Cat. Seals and Whales, Br. Mus.* p. 241.

Colour black. Dorsal fin high. Teeth $\frac{55}{55}$ small, slightly curved. Rostrum three-fifths of entire length. Palate grooved in the hinder half of skull.

Hab.—Sind, Kutch, and Malabar Coasts.

Platanista, Rostrum long, compressed, slightly enlarged at the extremity. Teeth as in Delphinus, recurved in both jaws. Paddles fan-shaped. Dorsal fin rudimentary. Eye minute.

Platanista Indi, *Blyth, Rep. As. Soc.* 13; *J. A. S. Bengal* xxviii., 493; *Cat. Mus. As. Socy. Beng.* 92; *Jerdon, Mammals of Ind.* 159; *Murray, Hdbk., Zool., &c., Sind.* Platanista Gangetica, var minor, *Owen. Cat. Ost. Mus. Col. Sing.*, 449, No. 2481. *Bhoolun, Sisur*, Sind; Soosoo, Hind.; *Sehoo*, Assam; *Hooh*, Sylhet.—THE GANGETIC AND INDUS PORPOISE.

Animal 5—8 feet long, with a long compressed snout, a vaulted compressed forehead, longitudinal blow-hole, scarcely perceptible eye, distinct neck, broad and abruptly truncated pectoral fins and a small (or rudimentary) dorsal fin; snout in males shorter (*Anderson, A. and Z. Res.*); ear-hole semi-lunar; teeth 27 on each side in the lower jaw, 26 in the upper—total 106, sometimes less. A specimen from the Indus, 4½ feet long, had pectoral fins or paddles, 7½ inches by 5, and a rostrum of 10¼ inches. Colour reddish salmon all over the body, except the tail, which was brownish grey. The dry skin becomes a pearly grey throughout.

Dr. Gray, in his *Cat. of Seals and Whales, Br. Mus.*, says:—That the skull of the Indus porpoise presented by Sir A. Burnes is conspicuously different from that of *P. Gangeticus*, that the maxillary crests are wanting, and that the skull is more robust. He gives the length of skull as 20½ inches, and the greatest width at zygomatic arches 9½", the symphysis of lower jaw 11 inches, length of the animal 7 feet. Dr. J. Anderson, F. R. S., Superintendent of the Indian Museum, after working up the question of separating the Indus and Gangetic species, concludes that the Indus porpoise does not differ in any very essential character to justify a separation. In his *Anatomical and Zoological Researches* will be found a very exhaustive description of the anatomy of this species. He has also, from personally watching its habits in a captive state, given a most interesting account of its mode of respiration, &c.

Hab.—The larger rivers connected with the Ganges, the Brahmapootra and Indus Rivers.

Fig. 2.

Fig. 1.

Fig. 1. Skull of Balænoptera Indica, Blyth. (*Side view.*)
Fig. 2. *Upper view*, with the tip of the snout completed.

The low castes in Sind, along the banks of the Indus, consider porpoise flesh a delicacy, and Dr. Anderson says that the Gurhwals, and some castes in the Jessore, Dacca and Burdwan districts, also in the N. W. Provinces about Allahabad, Benares, and the Punjab, also eat it. The oil is universally regarded as a valuable embrocation in rheumatism, for strengthening the loins, and for pains in the lumbar region generally. The illuminating powers of this oil, Dr. Anderson says, are said to be high. The fishermen in Sind use it on their boats for lighting, and also as a lubricant.

Family, BALÆNOPTERIDÆ.

Head enormous; spiracles double; belly smooth, with or without longitudinal folds; teeth none, but baleen present in the upper jaw; rostrum long, narrow, rounded; frontal bone flat, expanded, broad over the orbit.

Balænoptera, *Lacep.*—Characters same as those of the Family, but with an adipose dorsal fin; head one-fourth of total length or less; skin of the belly with longitudinal folds; cranium slightly arched.

Balænoptera Indica, *Blyth, J. A. S. B.* xxi., p. 358.

PLATE VI.

Length.—80—90 feet; lower jaw slender. There does not appear to be any reliable information as to the general form of the Indian Rorqual, although the animal is fairly common along the Western Coast as well as the Sind and Mekran Coasts. Jerdon records a whale supposed to be this species, 90 feet long and 42 feet in circumference, thrown, ashore, on the Chittagong Coast. Another, he says, was cast up dead on Amherst Islet, 84 feet in length, of which the rami of the lower jaw and a few other bones are in the Indian Museum at Calcutta; the length of each ramus is said to be 21 feet, and the radius 38·75 inches. A skull, of which a plate is given, was cast up on the Clifton beach, in 1879, and is now in the Kurrachee museum. It measures 17 feet 8 inches in length and 7 feet across the zygomatic arches.

Between Kurrachee and Bombay and on the Mekran Coast this species may be said to be fairly common. One was run over by the B. I. S. N. Co.'s Steamer *Euphrates*, about 60 miles from Bombay, nearly two years ago. The animal, it appears from the Captain's statement, seemed to amuse itself by crossing and recrossing the bow, and then at last suddenly turned and came straight for the vessel, striking it about 10 feet from the bow. The Government Steamer *Dalhousie* also fell foul of one in September 1880, and another was found entangled in the Submarine Cable on the Mekran Coast. Blyth, in an article on the Indian Rorqual (*J. A. S. B.* 1859, p. 481,) mentions that whales were known to, and recorded by, the ancients, and Nearchus, B. C. 327, sailing to the Persian Gulf, mentions having met with them, and that on the Mekran Coast the people built houses with the bones of stranded whales.

ORDER—RODENTIA.

Two incisors only in each jaw, large, incurved and without roots. Canines none. Molars usually few, varying from 2 to 6 on each side, and separated by an interval from the incisors. Feet with five toes. This Order embraces the squirrels, rats, mice, and hares.

Family, SCIURIDÆ,—Squirrels.

Quasi-incisors smooth. Molars usually $\frac{5-5}{4-4}$, or $\frac{4-4}{4-4}$, enamelled and furnished with roots. Tail long, bushy.

Sciurus, *Linn.*—Premolars $\frac{2-2}{1-1}$; molars $\frac{3-3}{3-3}$; quasi-incisors brown or orange coloured. Fore feet with only four toes, and a tubercle on the site of the thumb.

Sciurus palmarum, *Gmelin; Blyth, Cat. As. Soc. Mus.*, 339; *Jerdon, Mam. Ind.* p. 170; *Murray, Hdbk., Zool., &c., Sind,* p. 91. *Gilloree,* Sind.—The Common Striped Squirrel.

Fur dusky greenish grey above, with three yellowish-white stripes along the whole length of the back, and two fainter lines on each side; beneath whitish. Hairs of the tail variegated with reddish and black.

Length.—12—13 inches. Tail about one-half.

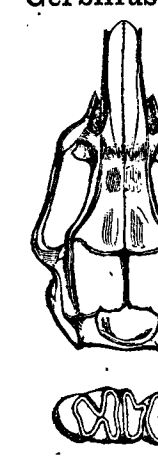
The only species of the genus in Sind. Found also in the Concans, Deccan, Kutch and Guzerat, and throughout the whole Peninsula of India.

Family, MURIDÆ.

Incisors compressed or rounded. Molars 3 or 4 on each side. Fore-feet usually with four toes; hind feet with five toes.

Gerbillus, *Cuv.*—Upper incisors grooved. Ears oval. Head lengthened and somewhat pointed. Tarsus and toes elongated. Tail long, hairy, with a tuft at the tip. Ridges of the molars variable.

Gerbillus indicus, *Hardwick, Linn. Tr.* viii., pl. 7; *Blyth, J. A. S. B.* 1863, xxxii., p. 327; *Jerdon, Mammals of Ind.* p. 184; *Blanford, Eastern Persia,* p. 63. Gerbillus Hardwickii, *Gray, Cat. Mam. B. M.* p. 132; *Murray, Hdbk., Zool., &c., Sind.*—The Jerboa Rat.



1, Skull of *Gerbillus Indicus,* nat. size.
2, Molar teeth of upper jaw, magnified three diams.

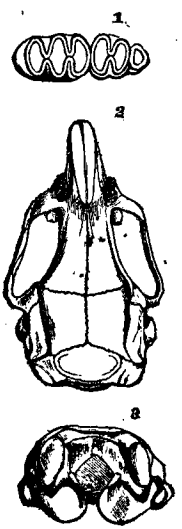
Fur above light fulvous brown, fawn colour, or bright rufous brown, many of the hairs tipped brownish; beneath whitish. Round the eyes brownish. Hinder parts of the cheeks rufous, paler in front. A white supercilium and a white band below the eye. Ears large, almost nude within, outside thickly covered with short brown hair. Whiskers long, black above, white below. Tail brown above, with a narrow band below of the same colour, paler on the sides and tipped with long brownish black hairs. Mammæ four pairs—two pectoral, and two inguinal.

Length.—Head and body 6 to 7 inches, tail 5½ to 7 inches, hairs at tip of tail ½ inch.

Hab.—Sind, Kutch, Western India generally, Punjab, N. W. Provinces, Beloochistan and Afghanistan, (Chaman) affecting the uncultivated and sandy plains, where it burrows to a depth of from 4 to 5 feet.

Gerbillus Hurrianæ, *Jerdon, Mam. Ind.* p. 186; *Blanford, Eastern Persia*, p. 68; *Murray, Hdbk., Zool., &c., Sind*, p. 68. G. erythrourus, *Jerd. ibid. nec. Gray.*

Much smaller than the last, the tail and ears also comparatively shorter. Above, the fur is pale rufous or sandy, with fine dusky lines, the hairs being blackish at the base, isabelline near the point with short dusky tips. A few longer hairs on the rump and thighs. Sides slightly paler with a few dusky lines. Lower parts whitish, tinged more or less with fawn colour on the belly, the line of demarcation of the two colours not strongly marked. Tail concolorous with the back, with a line of dusky hairs along the upper surface of the terminal portion, becoming longer near the tip, the hairs at the tip being ⅜ths of an inch long; ears small, round, thinly covered with short hair on the outside and near the hinder margin within; whiskers of moderate length; black above, white below; feet pale, hind ones thinly covered with whitish hairs below, except on the posterior half of the tarsus; soles of forefeet naked. Mammæ eight,—two pectoral and two inguinal pairs.



1, Molar teeth of upper jaw, enlarged three diams.
2 & 3, Skull of *Gerbillus Hurrianæ*, nat. size.

Length.—Head and body 5 to 5¼ inches, tail 5 to 6 inches, hind foot 1 inch.

Hab.—Abundant all over the Province to the Punjab, N. W. Provinces, Kutch, Beloochistan and Afghanistan, living in burrows at the roots of bushes.

Mus, *Lin.*—Incisors usually smooth in front. Ears rather rounded, and somewhat naked. Tail long, scaly, haired.

The synonomy of the Indian species of the genus *Mus*, which hitherto was in so much confusion, has now been cleared up by the labours of Dr. J. Anderson,* Superintendent of the Indian Museum, and Mr. Oldfield Thomas,† of the British Museum. Both eminent Naturalists have had access to large collections of typical specimens, as materials to work upon, and the result is an excellent synopsis of the species by Mr. Oldfield Thomas; that of the sub-genus Nesokia has been based on Dr. Anderson's sections in the paper already quoted.

The following are the sub-genera into which the Indian species of *Mus* have been divided :—

(1) Nesokia, (2) Mus, (3) Leggada, and (4) Vandeluria. Of these the two first only are represented in Sind.

* *J. A. S. B. vol.* 47, 1878, plates. † *P. Z. S.* 1881, plates.

Nesokia.—Incisors very broad, finely sculptured in front; molars composed of transverse laminæ; size large; form stout and heavy; tail rather short; fur coarse, *not* spiny.

The following characters of the Sind species are given by Mr. Oldfield Thomas :—

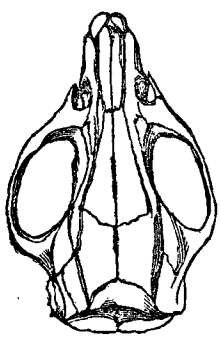
I. Anterior palatine foramina much shorter than the upper molar series. Mammæ 8 .....*M.* (*N.*) *Hardwickii.*

II. Anterior palatine foramina as long as, or longer than, the molar series. Mammæ 14—18.....*M.* (*N*) *Bengalensis.*

III. Palatine foramina as in II., though rather more open behind. Mammæ 12.....*M.* (*N*) *bandicota.*

Mus (Nesokia) Hardwickii, *Gray, A. and M. N. H.* x., p. 265.; *Anders. J. A. S. B.* xlvii., p. 221, 1878. Arvicola indica, *Gray and Hard. Ill. Ind. Zool.* i, pl. xi. Mus Hardwickii, *Gray, Charlesw. Mag. N. H.* i, p. 585. *Thomas, P. Z. S.* p. 524, 1881. Var Huttonii; Mus Huttoni. *Blyth, J. A. S. B.* xv., p. 139. M. (N) Huttoni, *Anderson.* l. c. p. 223. Nesokia Huttoni, *Blanf. East. Pers.* p. 59, pl. vi. fig. 1.

Fur variable in quality. Above yellowish brown, or bright rufous; dirty white or dull yellow below. In the variety *Huttoni* the fur is long and soft, of a bright rufous colour, and the hind feet are longer than in *Hardwickii.* Head short and bluff; muzzle broad and deep. Eye situated about half way between the ear and the end of the muzzle. Ears not large, rounded, semi-nude, but clad with minute hairs. Tail variable, ringed, nearly nude, less clad with minute hairs; upper surface of the feet sparsely clad. Fur generally soft and moderately long, (or silky in *var Huttoni*) and somewhat harsh sometimes. Pelage, of three kinds of hairs, short underlying fur, and ordinary hairs, intermixed among which on the dorsal and sacral regions are numerous long black hairs visible beyond the length of the fur. Skull stout and strong. Teeth more rounded than in other species.



Skull of Nesokia Hardwickii, nat. size.

Length.—Head and body 5·9″ to 7″, tail 3·8″ to 4·5″, hind foot 1·45″. The specimens from Lower Sind appear from comparative measurements given by Mr. Thomas to be smaller than those of Upper Sind, and the Beloochistan specimens of *Huttoni* larger than either the Lower Sind or Upper Sind specimens.

Hab.—Sind, Punjab, N. W. P., Beloochistan, Persia and Afghanistan.

Mus (Nesokia) Bengalensis; Arvicola Bengalensis, *Gray and Hard. Ill. Ind., Zool.* ii., p. 21. Nesokia Indica, *Blyth, J. A. S. B.* xxxii., p. 328; *Jerd. Mam. Ind.* pl. 187. Mus (N) Blythianus, *Anderson, J. A. S. B.* 47, p. 227, pl. xiii. Mus (N) Barclayanus, *Anderson* l. c., p. 229, pl. xiii., fig. i. to l.

Form stout and heavy, muzzle blunt. Fur rather short and harsh, grizzled, brown above, rather paler below, and of three kinds as in the preceding, but the piles are not numerous. Ears short and rounded, and laid forward, they do not reach to the eyes. Tail shorter than head and body, ringed and sparsely covered with hairs, uniform brown above and below. Feet of medium size, nearly always brown above. Foot-pads small and rounded, five on the fore and six on the hind feet as in the other species. Mammæ 1418,—often different on the two sides of the body.

Length.—Head and body 7 to 8 inches; tail 5 to 7.

The common Nesókia of all India. In Sind it has only been found in the Thurr districts and a little below. The Southern Indian race of this species is *Mus Kok*, Gray=M. *providens*, Ell. Madras Journal.

Mus (Nesokia) bandicota, *Bechst.* Mus giganteus, *Hardw. Tr. Lin. Soc.* vii., p. 306; *Anderson J. A. S. B.* 47, p. 232.

Size very large, one to 1¼ feet or more in length. Tail about the length of head and body or less. Fur coarse, grizzled, blackish grey and white above, grey beneath; long piles on the dorsal and lumbar regions, abundant. Tail broadly ringed, sparsely clad with short hairs. Feet well developed, sparsely clad above with short hairs. Moustache long.

Mammæ 12—three pectoral and three inguinal pairs.

Hab.—Sind (at Kurrachee only), affecting cotton godowns, and throughout the Peninsula of India.

Mus (*as restricted*).—Incisors narrow, smooth in front. Molars tubercular, not divided into transverse laminæ. Pollex only with a nail, the other digits with sharp compressed claws. Other characters variable.

The following is a synopsis of the species which occur in Sind:—

I. Hind feet with 6 well-defined foot-pads.

A Large, 4½ to 9 inches in length. Last hind foot-pad elongated= *Rats*.

a. Whole of tail covered with short hairs; upperside of tail dark coloured; 8—12 mammæ.

a'. Tail dark above and below, shorter than head and body; 10—12 mammæ; hind foot 1·5″—1·7″ ..... *M. decumanus*.

b. Tail longer than head and body, anterior edge of zygoma root with a strongly marked rounded angle above; 10—12 mammæ; hind foot 1·2″—1·45″ ..... *M. alexandrinus*.

II. Small, 2-4 inches in length. Hind foot-pad circular=*Mice*.

Anterior edge of zygoma root perpendicular; 10 mammæ; tail as long as, or longer than, the head and body.

1. Colour rufous brown, belly scarcely lighter; hind foot ·62″—·7″ ..... *M. urbanus*.
2. Colour pale fulvous, belly white; hind foot ·65″—·75″ ..... *M. bactrianus*.

III. Hind feet with only 4 or 5 well developed foot-pads; mammæ 8; tail about the length of head and body; hind foot about 1·0″ ..... *M. mettada*.

Mus decumanus, *Pall. Nov. Glires*, p. 91. M. brunneus, *Hodgs. Ann. and Mag. N. H.* xv., p. 266. M. decumanoides, *Hodgs. J. A. S. B.* x., p. 915; *Jerdon, Mam. Ind.* p. 195, *Murray, Hdbk., Zool., &c., Sind*, p. 92. *Chooah, Oondir*, Sind, Hind.—The Brown Rat.

Above dusky cinereous brown, with a tinge of yellow; the hairs slaty at base with a yellowish tip, and the longer ones dusky blackish, beneath dirty pale ashy. Ears as broad as long. Ear conch 0·7″, rounded. Tail 7·1″. Head and body 8·3″.

Hab.—Sind and throughout India. Found also in Persia. Spreads into Europe.

Mus alexandrinus, *Geoff. Desc. de l'Egypte, Hist. Nat.* ii., p. 733. M. asiaticus, *Gray, Charles. Mag. N. H.* i., p. 585. M. arboreus, *B. H. Horsf. Cat. Mus. E. I. C.* M. crassipes, *Blyth, J. A. S. B.* 28, p. 295, *Ind.*—Var nitidus, *Hodgson, Ann. and Mag. N. H.* xv., p. 267. M. pyctoris, *Hodgs. l. c.* Var rufescens *Gray, Charles. Mag. N. H.* i., p. 585. M. indicus *Geoff. Desm. Mam.* ii., p. 299. M. flavescens, *Ell. Mad. Journ. Lit. Sci.* x., p. 214. M. brunneisculus, *Hodgs. Ann. and Mag. Nat. Hist.* xv., p. 267.

Fur harsh, sometimes mixed with fine spines. Colour variable, above dark rufous grey to reddish fulvous, below white. Feet nearly always white. Tail longer than the head and body. Ears large, laid forward they reach quite to or even beyond the eye. Foot-pads 5—6. Mammæ 10, 11 or 12, normally three pectoral and three inguinal pairs, but one or both of the posterior pair often absent.

Length.—Head and body 6 to 6·8 inches; tail 7 to 9″; hind foot 1·2″ to 1·45″.

Hab.—Sind, Persian Gulf, Madras, Darjeeling and Ceylon. Occurs also in Gilgit and Egypt.

Mus urbanus, *Hodgs. Ann. and Mag. Nat. Hist.* xv., p. 269; *Jerdon, Mam. Ind.* p. 203; *Murray, Hdbk., Zool, &c., Sind*, p. 93. Mus musculus, *Ell. Madras Journ.* x., p. 214. M. nepalensis, *Hodgs. J. A. S. B.* x., p. 915. M. manii, *Gray, Cat. Mam. Br. Mus.* M. darjilingensis, *Hodgs. op. cit.* iii., p. 203. M. tytleri, *Blyth, J. A. S. B.* 28, p. 96. M. rama, *Cant. Blyth, J. A. S. B.* 34, p. 194.

Above dusky reddish or rufous brown, below rather paler. Fur short, crisp, quite spineless, slate-coloured for three-fourths the length at base and tipped yellowish or orange with a few black-tipped hairs intermixed in less bright-coloured specimens. Tail longer than head and body or equal, more or less pale beneath. Mammæ 10, three pectoral and two inguinal pairs.

Length.—Head and body 2·6″ to 3″; tail 3·20″ to 3·54″; hind foot 0·65″—0·68.″

The common house mouse of the whole of India.

Mus bactrianus, *Blyth, J. A. S. B.* xv., p. 140 ; *Blanf. Eastern Persia,* p. 56. pl. v. fig. 2 ; *Danfield and Alston, P. Z. S.* 1880; *Jerdon, Mam. Ind.* p. 205. *Murray, Hdbk., Zool. &c., Sind,* p. 93. M. gerbillinus, *Blyth, J. A. S. B.* xxii., p. 410. M. Theobaldi, *Blyth, J. A. S. B.* 22, p. 583.

Fur as in *M. urbanus,* colour light isabelline or sandy fawn. The bases of the hairs with a slaty tinge. Ears shorter than in *M. urbanus,* covered inside and out with short hairs of a sandy colour, under parts and feet white. Tail the length of the body, or a very little longer; brown above, white beneath, and clad with minute hairs. Mammæ as in *M. urbanus.*

Length.—Head and body 2″ to 3·4.″; tail 2·45″ to 3·55″; hind foot 0·65″ to 0·75″.

Hab.—Sind, N. W. Provinces, Cashmere, and westwards to the Euphrates; Muscat, Beloochistan, S. Persia and Afghanistan.

Mus mettada, *Gray, Charlesworth Mag. N. H.* i., p. 586. Mus lanuginosus, *Ell. Madras Journ. Lit. Soc.* x., p. 212. Mus mettada, *Blanford, J. A. S. B.* xlvi., p. 290., pl. 1, skull, foot, &c., *Jerdon, Mammals of Ind.* p. 213.—The Soft-furred Field Rat.

Fur long, soft or spineless. General colour above grey, below white. Hairs above dark slate colour for seven-eighths of their length, then yellowish white, the extreme tips black or dark brown; some have all the distal quarter of the hair black; these darker hairs as usual are more numerous along the centre of the back. Belly hairs slate colour for their basal three-fourths, the tips white, hiding the slate colour. The line of separation of the upper and lower colours as a rule is not well marked. Mammæ 8—two pectoral and two inguinal pairs. Tail about the length of the head and body. Hairs on the tail numerous, rather longer than most species, but not forming a pencil at the tip. Colour brown above, white below. The above is Mr. Thomas' description of Southern Indian and Ahmednuggur specimens.

In Sind specimens the general colour of the face is rufescent sandy, the basal half of the hairs being pale French grey, and the rest rufescent with some longer, black, and black-tipped hairs intermixed. The lower series of whiskers are white, and the upper dark brown. There is a patch of pure white on the snout all round and including the lower lip. The ears are round and covered inside and out with whitish hairs, the extreme outer margin intermixed with hairs which have dark brown

bases. A well-defined rufescent circle round the eyes. General colour of the back greyish, below whitish. The feet are white, the tail is covered with short hairs, and is sharply bicolor, the upper surface being dark brown and the lower white. Soles of feet naked. Pads on forefeet five. On the hind feet the sixth is always, and the fifth frequently, suppressed.

Hab.—Sind, Deccan, and Southern India in cultivated fields, living in holes at the roots of bushes or among stone heaps.

Family, HYSTRICIDÆ.

Molars $\frac{4-4}{4-4}$, lower angle of lower jaw acute, terminal portion of muzzle clothed with small hairs, the skull with a large ante-orbital opening.

Sub-family, HYSTRICINÆ,—PORCUPINES.

Incisors $\frac{2}{2}$, lower truncated; molars $\frac{4-4}{4-4}$ rooted, compound; tongue and body covered with spines; clavicles none; forefeet tetradactylous with a minute wart for a thumb.

Hystrix, *Linn.*—Temporal and orbital fossæ very small, parietal bones depressed, occipital and sagittal crests projecting much, tail short, feet plantigrade, the anterior tetradactyle, the posterior pentadactyle, armed with large nails.

Hystrix leucura, *Sykes, P. Z. S.* 1830, *Blyth, Cat.* p. 128; *Jerd. Mam. Ind. p.* 219. *Serr, Syal, Sinkore*, Sind, Hind.—THE INDIAN PORCUPINE.

Muzzle clad with stiff bristly hairs and a few white spines on the face; spines on the throat short-grooved, some with white points forming a demi-collar, spines and open tubes on the tail entirely white. Crest full, long, chiefly of black bristles, a few reaching to the insertion of the tail, and with long white points; the largest quills on the back black, many annulated with white at base and middle, and some with white points; long thin quills, mostly white at tip; whiskers, long and black, a few tipped white.

Length.—Head and body 32″, tail 7″, skull 5·25″, molars $\frac{3-3}{4-4}$ in four Sind specimens.

Hab.—Sind, the greater part of India, except Bengal, where it is replaced by *H. Bengalensis*; also Burmah and Ceylon, Beloochistan, Persia and Afghanistan.

H. Cristata, Linn. has been found by Mr. Blanford (Eastern Persia, p. 80) at Jalk (Beloochistan), and not unlikely it will be found in Sind, also on the hills north of Mugger Peer and those separating Sind from Beloochistan. *H. cristatus* differs from *leucura* in its general colour, being grizzled dusky black, resulting from a mixture of various shades of white, brown and black. Upper part of the neck and head furnished with a crest of long lighter coloured hairs. The muzzle and limbs are clothed with very short almost black hair. The whitish band on the fore-part

and sides of the neck is less distinctly marked than in *H. leucura*. The upper back, sides, rump, and upper parts of the hinder legs are spiny, and the spines longest in the middle of the back, about the size of a goose quill, striated longitudinally, and ringed an inch or so broad alternately with black and white, and the open tail quills are dusky. The animal measures from 20 to 22 inches, or a third less than *leucura*.

The Sind species is specially destructive to the potato crops. It lives in holes on the hill sides, and banks of the Indus, in the vicinity of cultivation. General MacMaster, in his notes on *Jerdon's Mammalia*, mentions an instance of his having dug out a porcupine of this species, and says that "the entrance of the animal's abode was a hole in a bank at which the dogs were yelping and barking; but the bipeds had gone more scientifically to work, by countermining from above, sinking shafts downwards, till at last they reached his inner chamber, when he scuttled out, and charging (as they always do, and not throwing their quills) backwards at the dogs with all its spines erected, he soon sent them flying, howling most piteously." The flesh of porcupines is much esteemed in some parts of India, and is in Europe also, when game is scarce, considered a great delicacy. They are very dainty feeders, and General MacMaster says, "this the gardeners know to their cost. A pineapple", he says, "is left by them (the porcupines) till the night before it is cut." Peas, potatoes, onions, &c., are not touched till the owner has made up his mind that they are just ready for the table.

Family, LEPORIDÆ,—HARES.

Fur soft. Upper incisors 4, lower ones subulate. Molars 5—6 above, and 6 beneath on each side; all rootless. Ears generally large. Eyes large. Forefeet short, with 5 toes. Hind feet long, with 4 toes. Tail none, or very short. Soles of the feet hairy.

Hares are diffused almost over every climate, and, notwithstanding they are hunted and shot everywhere, their numbers never diminish. They propagate the first year of their lives and bring forth four to six young at a time.

Lepus, *Linn.*—Incisors $\frac{4}{2}$. Upper in pairs (two in front, large and grooved, and two smaller behind). Lower teeth square. Molars $\frac{6-6}{5-5}$, composed of two soldered vertical plates; the last very small in the upper jaw. Soles of the feet hairy. Tail short, turned upwards.

Lepus craspedotis, *Blanford, Eastern Persia*, p. 80; *Murray, Hdbk., Zool., &c., Sind*, p. 93. *Sissa, Soho, Seher*, Hind, Sind.

Colour brown above, white below. Fur of the back pale French grey at the base, then black, and the tip pale brown, almost isabelline. The black rings are wanting on the fur of the nape, hind neck and breast, which, like the fore legs and hinder part of the tarsi, are pale rufous brown, ears externally mouse brown, blackish brown on the posterior portion near the tip, the anterior edges white with

rather longer hairs, except near the tip, where the hairs are short and black. The posterior margins inside pale isabelline, the pale edge becoming broader near the tip. Tail black above, white on the sides and below, whiskers black near their base, white, except on the shorter ones, throughout the greater part of their length; a pale line from the nose including the eye continued back nearly to the ear. Mr. Blanford gives the following dimenions of a ♀ in the flesh.

Length.—Head and body 15," tail 3·5", hairs at end of tail 1", = 19·5", ear outside 6", breadth of ear laid flat 3·25"; tarsus and hind foot 4·25", carpus and fore foot 2·5."—(*Blanf. East. Pers.*)

Hab.—Sind and Beloochistan.

Lepus dayanus, *Blf. P. Z. S.* 1874, p. 663; *Murray, Hdbk., Zool., &c., Sind.*, p. 93. *Sissa, Soho, Seher,* Hind., Sind.—THE SIND HARE.

"Back light brown, much mixed with black; hairs at the base nearly white, then black, towards the end pale brown, the tips being black; on the sides of the body the black gradually disappears; belly, as usual, white; inner surface of the thighs, sides, and lower part of tail the same. Upper part of tail brown, the hairs being dusky and almost black at the base, with brown tips; sides and lower part of neck as far back as the fore legs and the limbs pale rufous; soles of feet a little darker; back of neck behind the ears the same. Ears broad and rather long, apparently slightly exceeding those of *L. ruficaudatus*, both in length and breath; they are nearly naked on the greater part of their surface, both inside and out. The anterior portion of the outer surface is covered with short brown hairs mixed with black, the margin itself having a fringe of longer hairs, and the extreme hinder margin is covered with very short whitish hairs. The tips, too, are covered outside with dark brown hair, nearly black inside; near the edge only with yellowish buff. The hair on the posterior portion of the outer surface, near the base of the ears, is whitish.

"Distinguished from *L. ruficaudatus* by being rather smaller, by the hair being longer and very much finer, with, so far as can be judged by the specimen examined, much longer black tips to the hairs on the back. The tail in *ruficaudatus* is rufous brown above, whereas in the present species it is dusky brown above, and the hairs are blackish at the base. In *ruficaudatus* the nasal bones are longer and much more convex anteriorly, and the posterior prolongation of the post-orbital process is not in contact with the skull behind, whereas in *L. dayanus* this prolongation joins the skull so as to leave a foramen behind the post-orbital process, as in *L. mediterraneus*, which has, on this ground alone, been considered generically distinct from other hares by Dr. Gray. (*Ann. Mag. and Nat. Hist.* 1867, p. 222). In the skull of *L. dayanus*, which I have examined, the post-orbital process is not anchylosed with the frontals behind the foramen, but it may very probably be so in older animals.

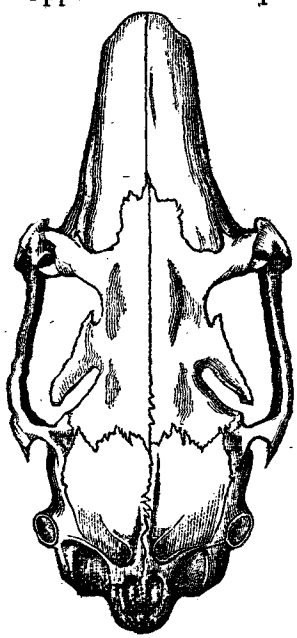
"All the teeth are smaller than in *L. ruficaudatus*, but the upper incisors appear very indistinctly grooved, and so far as I can judge never

have the raised ridge along the front part of their inner edge so conspicuous in old skulls of *L. ruficaudatus*.

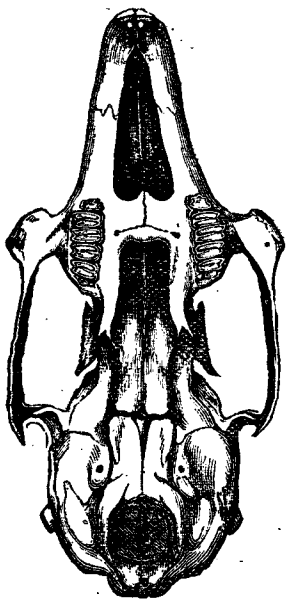
Length.—From nose to rump about 18 inches. The ears are 4½ inches long from the orifice to tip, and nearly 2·5″ broad; in fresh specimens they would be 5 inches long at least. The tarsus and hind foot to the end of the claws measure just 4 inches; this measurement of course would be the same in the living animal. The skull extracted is imperfect behind; the breadth across the hinder and broadest part of the zygomatic arches is 1·55 inch, across the frontal bones, where narrowest, and between the foramina, behind the post-orbital processes, 0·47″. Length of suture between the nasal bones 1·1.″"—*Blanfd. P. Z. S.* 1874, p. 663.

Lepus joongshaiensis, *sp. nov.*—THE JOONGSHAI HARE.

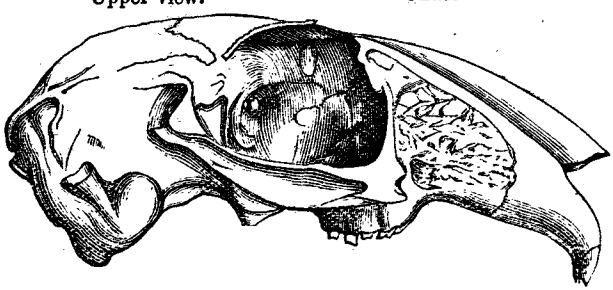
Upper and lower lip and chin white. Upper series of whiskers entirely black; median series white with black bases; the lower series and those fringing the upper lip entirely white.



Upper view.



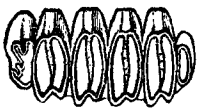
Under view.



Side view.

Skull of Lepus joongshaiensis.

A pale fulvous, or fulvous white line from the nostrils on each side, including the eye, and for about half an inch behind it. Hairs on the snout rufescent, mixed with blackish on the forehead, black at the base and tip, with a broad fulvescent band in the middle. Ears externally covered with short fulvescent and black hairs, internally with whitish hairs, except for about 0·25 inch along the outer an-



Molars enlarged.

terior edge for the length of its basal half where it is mixed with black; the inner margin of the conch is clothed with long white hairs, which project from its outer edge, and become shorter, closer, and buffish round the margin of the tip, where it is backed by black hairs on the outer margin. Fur behind the ears at the base, and on the sides of the nape, greyish white. A distinct broad, unmixed rufescent earthy streak from between the ears, behind, to between the shoulders. Ruff below the neck and the sides of the body, above the white of the belly, pale earthy fulvescent, largely mixed with long black spiny hairs, some with black bases and tips and a broad fulvescent mesial band. The upper breast *is not white* as shown in the plate, of *L. craspedotis* (*Blanf. East. Pers.*). The under-fur of the upper parts is pale French grey, or light ashy. On the back the fur is soft and long, with broad white bases followed by a dark band, and a subapical fulvous one; the apices narrowly black. Tail black above, white below, with an intervening line of longish, earthy fulvescent hairs.

Inner surface of the thighs, the belly, and under side of the tail, white, externally the limbs are rufous; the tarsi and soles of the feet are dark earthy rufescent brown.

Length.—Head and body 18 inches; tail 3″ = 21. Ears from base of skull 5 inches, greatest breadth 2·6″. Tarsus to tip of nail 4·12″.

The length of the skull is 3·25 inches; the width across zygomatic arches where broadest behind, 1·5″; width across frontal bone, where narrowest, behind the post-orbital process, 0·5″. Suture of nasal bones 1·12″, suture of frontal plate 1·37″. Width of brain case 1·06″. The hind superciliary or post-orbital process is serrated; its hind process is free and not anchylosed to the frontal bone behind, and the greatest width across is 0·93″. The nodosity on the anterior angle of the zygoma, above the molars, is large, nearly flat below; its hind margin grooved with a deep hollow to receive a tendon. The greatest width across these is 1·44 inches. Upper incisors distinctly grooved. The molars are larger than those of *craspedotis* and *dayanus*, the third and largest being 0·18″ across; the four middle ones with a prominent ridge in the centre, their outer edges grooved; the first molar is accumbent on the second, with three grooves and three ridges anteriorly. The palatal foramen is 0·25 inches wide anteriorly, while in *dayanus* it is just 0·12″. In *dayanus* there is a small projection or point behind as well as in front of the bone separating the palatal foramina, but in this species or form it is wanting behind.

I provisionally name it *L. joongshaiensis*. I am indebted to Mr. Gopal Jairam, the Station Master, at Joongshai, and to Mr. F. Gleadow of the Forest Department, for specimens of this form.

ORDER—BELLUÆ.

Pachydermata, *Cuv. Regne. Anim.* Ungulata, *Owen.*

Teeth of two forms. Upper incisors 6 or none, molars all similar. Canines often wanting or rudimentary. Toes hoofed. Skin thick, with scattered hairs. Mammæ pectoral or inguinal.

SUB-ORDER II.—SOLIDUNGULA.

Nose round, soft, simple. Neck elongate. Upper lip prehensile. Incisors in each jaw, normal, erect. Canines normal or wanting. Toes single (two united together) and covered with a single hoof.

Family, EQUIDÆ,—Horses.

Toes covered with a single hoof; lateral rudimentary toes subequal. Teeth 40.

Incisors $\frac{6}{6}$. Canines $\frac{1—1}{1—1}$. Molars $\frac{6—6}{6—6}$ or $\frac{7—7}{6—6}$. Molars complex, with square crowns marked by laminæ of enamel. Crown of incisors furrowed by a groove. Mammæ inguinal.

Equus, *Linn.*—Tail covered with long hair to the root. Fore and hind legs with a wart (sellander) on the inner side.

Equus caballus, *var domestica.*—The Sind horse is an interbreed from the Persian and Kattiawaree chiefly, generally with a longish head and narrow chest, but with fairly well formed croup. Usually very quick; the body is somewhat heavy, but the animal is capable of enduring much fatigue. The smaller breeds known as tattoos are very sure-footed animals, with hardy constitutions, good and firm hoofs. They are used both for riding and carrying burdens, and chiefly the latter.

Asinus, *Gray, Zool. Journ.* i, p. 261; *Cat. Bellucæ and Brutæ Br. M.* p. 267.

Upper part of tail covered with short hair; lower part covered with long hair forming a tuft; forelegs only furnished with warts. A dorsal and more or less distinct humeral stripe.

Asinus vulgaris, *Gray, Zool. Journ.* i, p. 244; *Cat. Mam. Br. Mus.* p. 268; *Cat. Bellucæ and Brutæ*, p. 268. *Guddha* of the Hindoos; *Garrow*, Mahr; *Khur*, Pathan; *Guddha*, Sind; *Djark*, Arab. —The Domestic Ass.

General colour uniform grey with a longitudinal dorsal streak, and a dark streak across the shoulders. Ears elongate. Facial line arched. Skull with sub-orbital foramen, as in *E. hemionus*, rarely of a darker colour than grey, or skewbald.

The ass varies in size and appearance in different climates, usually small and shaggy in cold climates; whether it is found in a truly wild state, is doubtful. In Sind the Banians (Hindoos) or grocer section of the community utilize this animal for riding purposes, and in fact prefer a good ass to a horse, as it would carry both its owner and about

two maunds of goods for miles without being fatigued. When used for riding only, the Sind animal is very fleet. In general it does not exhibit the proverbial stupidity and obstinacy it is credited with.

Asinus onager, *Gray, Cat. Ungulata, Br. Mus.; Cat. Belluæ, Br. Mus.* p. 269. Asinus indicus, *Sclater.*—The Goorkhur of Sind and Beloochistan.

Of a pale reddish or isabelline colour. Muzzle, breast, lower parts and inside of limbs and buttocks white, dorsal streak black, rather wider over the small of the back. Tail tuft and mane blackish brown, frequently a dark cross stripe on the shoulder. Limbs sometimes faintly barred. Ears sandy externally, white internally with a black tip. Skull with the infra-orbital foramen high up. Height 11—12 hands.

Hab.—Sind, in the Thurr districts, and west of the Indus River; Beloochistan, extending into Persia and Turkistan as far north as N. lat. 48°. Dr. Gray says they are abundant in Mesopotamia. In Persia they inhabit the deserts in troops. In Beloochistan, Blanford (*East. Persia*) says, they are abundant near Bampur. In the great deserts of Tartary they inhabit the dry and mountainous parts, arriving in vast troops to feed during the summer in the tracts east and north of Lake Aral. About autumn, Burroughs says, they collect in herds of hundreds and even thousands, towards Persia, which is their usual place of retirement, about the mountains of Casbin. The Arabs and Tartars take them in snares for the sake of their flesh, which is said to be unsavoury fresh killed, but excellent meat after keeping. The Persians are said to catch them and break them in for draught, and on account of their untameable nature, those successfully broken in are sold at high prices, especially those fit as stallions for crossing with the domestic ass. Their food in the wild state is the salt plants, such as *Kali, Atriplex, Chenopodium*, and some species of *Euphorbia*. Its bile is a specific among the Persians for dimness of sight. Shagreen is made from the skin of these animals, also of horses and asses, and forms an important article of commerce in Persia and Astrakhan.

Family, SUIDÆ,—Pigs.

Head pointed. Snout blunt. Ears large. Body compressed. Skin covered with bristles. Molars tubercular, with a few separate roots. Canines in the males large in both jaws, the lower pair prismatic, triangular; the upper, round, recurved. Teeth 40-44. Incisors various $\frac{3-3}{3-3}$. Premolars $\frac{4-4}{4-4}$ or $\frac{3-3}{3-3}$. Molars $\frac{3-3}{3-3}$. Teats 10, rarely 8.

Sus, *Linn.*—Face conical, simple, or with 2—3 warts on each cheek. Ears ovate, hairy. Tail moderate, tufted. Incisors $\frac{4}{6}$ or $\frac{6}{6}$.

Sus cristatus, *Wagn.* Sus aper, *Hodgs. J. A. S. B.* x., p. 91. Sus scrofa var indicus, *Horsf. Cat. H. E. I. C. Mus.* Sus Indicus, *Gray, List Mam. Br. Mus.* p. 185; *Horsf. P. Z. S.* 1852; *Murray, Hdbk., Zool., &c., Sind.* Sus aper, *Hodgs. J. A. S. B.* x., p. 911.—*Boora Janwar*, Hind; *Dookur*, Mahr; *Ratpunny*, Madras; *Sooar, Dhookar*, Sind.—The Indian Wild Boar.

Bristles of forehead, occiput, and back, elongate and forming a recumbent mane. Cheeks with a beard. A bundle of long black bristles on the throat. Body scantily covered with brownish black, and yellowish brown hairs. Tail covered with short hairs, with long lateral bristles. Nose and extremity brownish. Ears moderate, covered with scattered bristles. Head without any warts. Hoofs black. The young is of a fulvous colour, and striped with dark brown.

Length.—Head and body 5 feet or more. Tail 1 foot. Height 30 to 31 inches. Skull, length 13 to 15½ inches, height 8½ to 9 inches. Concavity on cheek, in front of orbit, deep and wide behind (variable in depth), and separated from the orbit by a well-marked ridge.

Hab.—Whole of India to the foot of the Himalayas and Arrakan, from the level of the sea to 12,000 feet elevation.

RUMINANTIA.—(PECORA, *Linn.*)

ORDER—PECORA.

Teeth of two or three kinds. Incisors 8 below. Molars 6 on each side in each jaw. Canines more or less developed. *S. O. cavicornia.* Front of upper jaw toothless. Horn-like prominences of the frontal bone covered with a permanent horny sheath.

Family, BOVIDÆ.

Nostrils open, bald within; nose bovine; muffle large, moist. Horns smooth, spreading laterally, cylindrical or depressed, situated on the frontal edge. Skull without sub-orbital pit. Of this Family we have—

Bos taurus, *Gray.*—THE BULL.—Domesticated throughout India. The Zebu (*Bos indicus*) is not found domesticated in Sind. The Buffalo (*Bubalus buffelus, Gray*) is extensively reared, in Lower Sind especially, and used as milch cattle.

Family, HELEOTRAGIDÆ,—TRUE ANTELOPES.

Nostrils bald within, open. Nose bovine. Muffle large, naked, moist. Crumen distinct or rudimentary. Horns conical, annulated, rarely present in females.

Tetracerus.—Horns, in the males only, four. Front pair very short. Sub-orbital fossæ large, shallow. Feet pits in the hind feet only. Mammæ four.

Tetracerus quadricornis, *Gray, Cat. Ungul. Br. Mus.* p. 68; *Cat. Rum. Mam.* p. 18; *Jerd. Mam. Ind.* p. 274; *Murray, Hdbk., Zool., &c, Sind. Chowsinghee*, Sind, Hind.—THE FOUR-HORNED ANTELOPE.

Uniform brownish bay above, lighter beneath. Middle of belly and inside of limbs white. Forelegs dark. Muzzle and edge of the ears with long hairs. Upper pair of horns about 3 inches long, smooth, black, pointed, erect and bending slightly forward. The additional pair in front are between the orbits from ½ to ¾ of an inch in length, blunt, and erect.

Length.—Head and body 38 to 42 inches, tail 5 to 6 inches, height at shoulder two feet or more.

Hab.—Sind and the Punjab, but is rare and seldom seen in open plains, except in places where the herbage is not stunted, Jerdon says it is found throughout India. It abounds in the hills of the Eastern Ghâts, from near Madras northwards. Not known in the Gangetic Valley, nor in the countries to the east of Bengal.

Family, ANTILOPIDÆ,—Antelopes.

Nostrils open, bald within. Nose bovine, narrow, simple. Crumen distinct. Horns in males and females. False hoofs well developed. Skull—nose aperture moderate, intermaxillaries generally reaching to the nasals.

Gazella.—Fur short, close-pressed, no dorsal streak. Knees tufted. Horns lyrate, elongate, closely ringed. Eye pits small, groin pits distinct, feet pits in all feet.

Gazella bennetti, *Sykes; Jerd. Mam. Ind.* p. 280; *Murray, Hdbk., Zool., &c., Sind,* p. 97.—The Chinkara or Ravine Deer.

Colour above deep fawn brown, darker where it joins the white of the sides and buttocks. Chin, breast, lower parts, and buttock behind, white. Tail, knee tufts, and fetlocks, black, a dark brown spot or patch on the nose, and a dark line from the eyes to the mouth, bordered by a light one above.

Length.—Head and body of adult male 42—44 inches. Tail 8—9 inches. Height 26—28 inches. Horns 12—13 inches. Largest pair in Kurrachee Museum 14½ inches. As a rule the Sind form has the tips of the horns curved forward. Horns of females 4—6 inches long.

Hab.—Sind, Punjab, N. W. Provinces, Kattiawar, Guzerat, Central India and the Berars, Kutch, Rajputana, and Hurriane. It is numerous everywhere in Sind on the low undulating hills. On the Pubb range it is met with usually in company with the Gud, *Ovis cycloceros.* Dr. Jerdon mentions *Gazella christii, Gray,* from Sind and Kutch, and says it is paler in colour, with the horns smaller and more slender, and with the tips abruptly bent inwards. This is joined by Blyth to *Bennetti.* It is possible that *G. subgutturosa, Gray,* of North Persia, occurs in Sind.

Family, CAPRIDÆ,—True Goats.

Horns, usually in both sexes, situate behind the orbits, erect, compressed, curved backwards, with a longitudinal keel in front. Chin of males bearded; bony cores of the horns, thick, porous and cellular.

Capra, *Linn.*—Horns in both sexes long, angular and recurved. No muffle, nor eye or inguinal pits. Feet pits in the forefeet only, or in none. Females with two mammæ.

Capra ægagrus, *Pall. Zool. Rosso. As. De F. Viag in Pers; Hutton. Calc. Journ. Nat. Hist.* pl. xix., p. 521; *Blanford's Eastern Persia,* p. 89; *Murray, Hdbk., Zool., &c., Sind.* Hircus gazella, *Gray. Cat.*

Rum. Mam. Capra caucasica, *H. Smith.* Capra gazella, *Linn.* The *Pasang* (male) and *Boz* (female) of the Persians and Afghans; *Surrah* of the Sind Hill Tribes and Beloochis.—THE WILD GOAT OF ASIA MINOR, or the SIND IBEX.

Colour variable seasonally; generally light or fulvous brown, lighter in summer; a conspicuous dorsal streak present. Horns recurved, triangular, 40—58 inches along the curve. Upper scimitar-like edge much worn, rugose or broken into irregular knots.

Length.—6 to 6½ feet including the tail, which is small.

Captain Hutton (*Calc. Journ. Nat. Hist.*) in describing this species says:—"The colour of the animal varies with age and season, but it may be said generally to be of a brownish grey, more or less intense. During the winter it is paler, and in old specimens altogether pale grey. The face in the mature male is of a deep sooty brown approaching to black, interspersed with grey at the base of the horns and on the cheeks; the forepart of the throat and chest are also of the same colour, which rises obliquely from the latter round the shoulders and unites at the withers, so as to form a dark and distinctly formed collar, while the same colour again extends itself in a stripe along the back from the base of the horns to the extremity of the tail, which is wholly dark brown or blackish. Tail short, naked beneath, and carried, when the animal is alarmed and on the alert, turned up and firmly pressed against the back, as in the domestic goat. In general, at other times, it is pendant. Beard moderately long; deep brown or black, sometimes interspersed with a few white hairs, and springs from the chin. Shoulders deep brownish grey, which colour continues down to the knees, from thence to the fetlocks, and forms two bands round the leg, the one at the knee and hock, the other at the pastern joints. Belly and under parts whitish, with a deep brown median line on the sides, which passes along the anterior edge of the hind legs.

In summer the colour of the fur changes much. The whole of the upper parts being of a yellowish or fawn coloured brown; the mane on the neck and withers nearly or altogether wanting, and the face has a brown front or streak down its centre, with a stripe of the same colour from the inner canthus of each eye to the nostril. The throat and chest are less dark, and the collar round the shoulders often wanting. In immature specimens the colours are much the same as the summer dress, but the dark lines are always less intense and often wanting.

The adult female has the colours of the upper parts grey, with a shade of pale brown over all; and a broad dark brown stripe down the centre of the face, with another from the inner canthus of the eye to the nostril. Dorsal stripe present or absent. *Beard none.*

The horns of the male differ in length according to the age of the individual. They are (in adults) very large, semi-elliptical, curved strongly backwards, and gradually outwards towards the apex, approximated at the base, divergent at the summits, and transversely wrinkled. The annual markings of increase are very strong and remarkable, standing forward on the anterior edge or angle, in prominent,

somewhat irregular rounded knobs. This peculiarity, Captain Hutton adds, is caused by the acute edge of the horn being chipped and worn away by friction and combat, but the general opinion of the natives in Sind is that these rugose prominences are caused by the animal letting itself down on its horns in descending crags when pressed or when it has missed its footing. At the base the horns are destitute of these prominences. The following are measurements of horns of females given by Captain Hutton:—

1. Length along curve, from base to apex, 13 inches, distance apart at apex 5½ inches, apart at base 1¼", basal circumference 4". Horns much wrinkled with transverse rugosities.

2. Length along curve 12," between the apices 4," distance apart at base 1," circumference at base 3½ inches. The horns much wrinkled with transverse rugæ.

Hab.—Sind; the Pubb range of hills, also the mountainous regions of Beloochistan, Afghanistan, Sooliman and Hazara ranges, Persia and Asia Minor. It inhabits a great range of climate from 1,000 feet above the sea, close to the coast of Beloochistan, and Mr. Blanford (*Eastern Persia*) adds on the peaks of the Elburz, ten degrees further north at a great elevation.

Captain Hutton, who has paid much attention to the habits of this species, and also of the wild sheep (*Ovis Cyloceros*), says: "The attitude of the animal, when on the alert, and springing fearlessly from crag to crag in the rocky fastnesses, is bold and haughty, giving an idea of great muscular strength and agility, which the animal possesses in no ordinary degree. But its speed is not sufficient when it descends to the plains to preserve it from the greyhound. It is, however, only when driven from its haunts by the intensity of the winter that he condescends to visit the lowlands, and that but rarely. Its usual quick pace is a kind of canter, which, among hills, enables it rapidly to evade pursuit, but is not nimble enough, nor is the stride sufficiently long to suit it to the plain lands, though for scaling mountainous heights it is admirably adapted. The leaps these animals take are tremendous and almost pass credibility, and the faculty or power of stopping *dead-short* must be of much service in leaping down crags to avoid falling into the yawning chasms and precipices of the mountains."

It is a very shy and wary animal, and, like the Himalayan species, hard to circumvent under any circumstances, and "Spindrift," in an article on ibex shooting ("*Asian*," July 1830), which is equally applicable to Sind, says: "But whatever chances of success a man by himself may have in pursuit of the animal, the chance is just halved if he be accompanied by a friend, for there are two men, instead of one, who may slip, sneeze, stumble, show themselves, or do the hundred and one things that may spoil a stalk." He adds—"If, however, quite by yourself, wary as the animal is, you can generally get near enough for a shot by exercising a little patience and paying attention to a few well-known rules. For instance," he says, "you must make an early start and climb at once to the top of the ridge on the slopes of which you

hope to find your game. It is all important to get above the animals, whose chief vigilance is directed down hill. During the day-time ibex remain high up lying down and sleeping, generally in some commanding position, where to approach them may be impossible. But in the evening they come down to the grassy slopes to feed, and remaining there all night, wend their way up again in the early morning. This is the time to look for them. If you have got on to your ground early, you may be fortunate enough to waylay a herd as they leisurely browse their upward way to their retreat for the day. If not, you must mark them down, and when they are comfortably settled, try and stalk them. This of course," he says, "is the 'real Jam.' It may take you hours of hard work and break-neck climbing to get near them, but you are repaid at last."

The flesh of the ibex is excellent venison. The skins are converted into water and flour bags by the hill tribes, and the horns carried by certain sects of mendicants as an insignia of their calling and as "trumpeting horns." The true bezoar, (pa-zahr) a calcareous concretion is said to be obtained from the stomach of this animal. It is to the present day highly prized as a sovereign antidote to snake and other poisons, and as an universal remedy for all diseases. There is a very large specimen in the possession of one Chuttunmull, a native druggist at Hyderabad. It measures 2¼ inches in diameter. The surface is polished and is of a greenish olive colour. The price paid for the specimen, he said, was Rs. 175. Smaller specimens are obtainable for from Rs. 50 to 75.

Family, OVIDÆ,—Sheep.

Horns behind the orbit, more or less spiral, wider than deep, angular, much wrinkled, turned downwards, often almost into a circle. No muffle, no beard. Throat with long shaggy hair. Mammæ 2.

Ovis cycloceros, *Hutton, Calc. Journ. Nat. Histy.* vol. ii., 1842, p. 514; *Jerdon, Mammals of Ind.* p. 295; *Gray, Cat. Rum.* p. 55; *Murray, Hdbk., Zool., &c., Sind.*

Horns subtriangular, much compressed laterally and posteriorly, transversely sulcated, curving outwards and returning inwardly towards the face. General colour rufous brown, or uniform yellowish or fawn-coloured brown. Face livid or bluish grey. Sides of mouth and chin white. Belly and legs below the knee whitish. A profuse beard from the throat to the breast intermixed with some white hairs reaching to the level of the knees. Tail short, white. Eye pits large. Horns 2½ to 2¾ feet round the curve. Diameter at base 4 to 4½ inches.

Female, with short straight horns, slightly bent behind. No beard.

Hab.—The warmer mountainous regions of Sind, Punjab, Beloochistan, Persia and Afghanistan, at less elevations than the ibex, and during winter frequently on the plains and valleys. In the Himalayas it is said to be rare, being confined to the belt of country between Cashmere and the Indus Valley, but in the Sooliman, Hazara and Salt Range of the Punjab, numerous, in fairly large flocks.

In general it is extremely shy and wary, and said to be difficult to approach, taking alarm at the least noise, even of the making of one of their own party while browsing. Like most wild ruminants this sheep also has a sentinel posted when the herd is feeding. In some districts, however, where they have not been hunted, they are said to feed with domestic cattle, &c. When taken young they are easily domesticated; but the rams are treacherous, making sudden and fierce attacks upon unarmed persons.

Family, CERVIDÆ.

Nose tapering. Muzzle moist. Muffle naked. Crumen distinct. Antlers well developed. Sub-orbital pit distinct. Canines small, rudimentary. Fur of young spotted.

Hyelaphus, *Gray, Cat. Ungul. B. M.*—Upper part of antlers simply forked. Tail rather elongate, acute at the end. Antlers on an elongate hairy pedestal. Upper tine on inner hinder edge of the beam. Face short, broad and arched.

Hyelaphus porcinus, *Gray*. Axis porcinus, *Zim. Jerd. Mam. Ind.* p. 263; *Murray, Hdbk., Zool., &c., Sind.* p. 96.—THE PARAH or HOG-DEER.

General colour light chestnut or fulvous. An eye-pit—Margin of lips, tail beneath, limbs within, and belly, white. In summer a few white spots are present. The young are spotted as in *Axis maculatus*.

Length.—Head and body 44 inches. Tail about 8 inches. Height 28 inches. Horns 15 to 22 inches, generally short with short snags.

It is easily distinguished from *Axis maculatus* (the spotted deer or chittul) by the absence of a distinct black dorsal stripe and white on its haunches.

Hab.—Sind, Punjab, N. W. Provinces, the Gangetic Valley, Assam, Sylhet, and Burmah; also in Central India and Ceylon. In Bengal, Jerdon says, it is abundant in many parts near the foot of the Himalayas, in Deyra Dhoon and near the Ganges, Sutlej and Jumna. In Sind, as elsewhere, it prefers the vicinity of water, affects chiefly open forests, especially among the high grass along the banks of the Indus.

ORDER,—BRUTA.

Teeth of one or two kinds; all very similar, often entirely wanting. Molars rootless. Toes united in the skin to the claws, which are conical and rather compressed. Tongue elongate. Mammæ pectoral or abdominal.

Pholidotus, *Gray*.—Fore and hind feet entirely covered with scales, continued to the base of the claws. Mammæ pectoral.

Pholidotus indicus, *Gray, P. Z. S.* 1865; *Cat. Bruta, Br. Mus.*; Manis pentadactyla, *Lin. Syst. Nat.* i. p. 51; *Jerdon, Mam. Ind.* p. 315; *Murray, Hdbk., Zool., &c., Ind.* p. 98. (*Chulla-Mirroon* Sind; *Kowlee Manjur*, Hind. Dec.—THE INDIAN SCALY ANT-EATER.

Head small in proportion. Muzzle conical, and elongated. Scales on the head small, increasing in size on the back of the neck and on the back; largest in the lumbar region and base of tail with coarse fulvous bristly hairs issuing from under each. Sides of the face, chin, throat, and under surface of the body sparsely covered with fulvous, stiff bristly hairs. Ears with a slightly raised edge; no distinct conch. Tail as long as the body. The fully developed fœtus, covered with scales like the parent. Middle claw of forefeet about four times the length of the outer. Eyes black. Soles of forefeet smooth and flabby; of hind feet black, tough and spongy.

Length.—Head and body 26 to 30 inches.

Hab.—Sind, especially the Southern Districts, Central and South India, Orissa and Bengal; extends to Nepal and Ceylon. Found also in the Deccan.

This armour-clad creature appears to be very tenacious of life. A live specimen in my possession, which refused food and drink of every kind, lived for nearly three weeks. White and black ants are its favorite food in Sind, for which it burrows from 6 to 10 feet in the ground. It walks with its claws turned inward on the sole of the feet, and when disturbed, rolls itself into a ball. The entire body of this animal especially beneath every scale, is always covered with a small bluish tick. Its flesh is considered aphrodisiac by the natives of Sind, and also of the Deccan.

CLASS II. AVES.

Vertebrated, oviparous, red and warm-blooded feathered bipeds with their pectoral or anterior limbs organised for flight. Lungs fixed and perforated. Respiration and circulation double.

ORDER, RAPTORES,—BIRDS OF PREY.

ACCIPITRES, *Linn.*

Bill short, strong, stout, covered at the base with a cere or naked skin, and strongly curved, the tip perpendicular; nostrils open. Legs and feet muscular, armed with curved, sharp, elongated talons capable of being bent under the feet. Toes four, three in front and one behind; upper mandible longer than the lower one; the edges with one, and sometimes two, sharp or blunt festoons.

Family, VULTURIDÆ,—VULTURES.

Upper mandible not toothed, sometimes sinuate; head and neck more or less bare, or clothed only with short down. No true feathers on crown of head.

Sub-Family, VULTURINÆ,—VULTURES PROPER.

Nostrils not perforated. First quill short; third and fourth sub-equal, fourth longest. Tarsus reticulated.

Gen. **Vultur.**—*Linn.*

Bill higher than broad; cere large; nostrils rounded, naked.

Vultur monachus, *Linn. S. N.* i. p. 122; *Jerd. B. of Ind.* vol. i, p. 6; *Hume, Str. F.*, vol. vii. p. 321; *Murray, Hdbk., Zool., &c., Sind.*—THE CRESTED OR GREAT BROWN VULTURE.

Adult.—Colour rich dark chocolate-brown throughout, including the crop patch, darker on the wings, tail and under parts. Feathers of the nape lengthened, lanceolate, and forming a ruff. Lores, cheeks, and throat downy, also a patch on the occiput; rest of head and neck both behind and laterally is bare, of a livid flesh colour in life. Bill black; feet yellowish; iris dark brown.

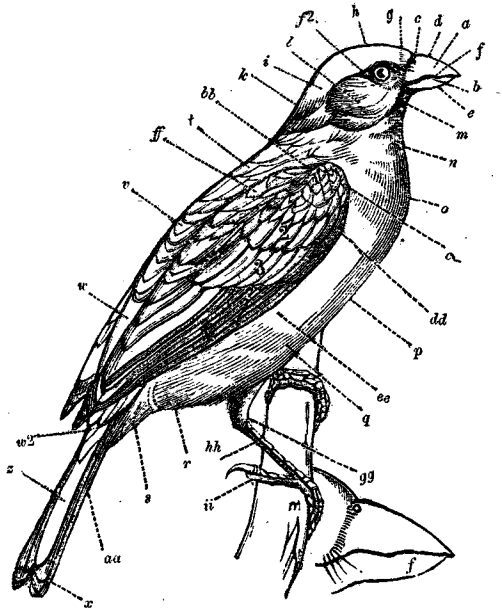
Length.—42 to 45 inches, expanse 96 to 118, wing 29·5 to 32, culmen 33, tarsus 4·25.

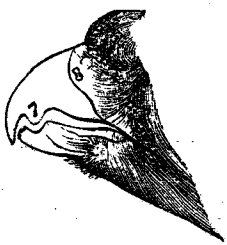
Hab.—A native of Europe. Found on the lofty mountains of Italy, the Tyrol, and also in Africa. In India it affects the hilly ranges of Central India, Guzerat, and Sind; occurring in the latter only in the winter months.

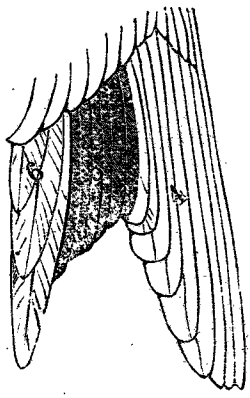
Gen. **Otogyps.**—*Gray.*

Tarsus longer than middle toe; head and neck bare, with fleshy folds and a neck-lappet or wattle of skin.

Otogyps calvus, *G. R. Gray, Gen. B.* i, p. 4; *Jerd. B. of Ind.* vol. i, p. 7; *Hume, Str. F.*, vol. viii., p. 370; *Sharpe, Cat. Acc. Br. Mus.*, p. 14; *Murray, Hdbk., Zool., &c., Sind.* Vultur calvus, *Scop. Del. Faun. et Flor. Insubr.*, vol. ii., p. 85. V. pondicerianus, *Lath. Ind. Orn.* i, p. 7; *Ran-Gidh, Bhaonra*, Hind.; *Wudda Gidh*, Sind.—THE BLACK VULTURE.







a Upper mandible.
b Lower mandible.
c Nostrils.
d Culmen or keel.
e Gonys.
f Margins of mandibles or commissure.
f2 Ophthalmic region, or orbit.
g Forehead.
h Crown.
i Sinciput or hind head.
k Nape.
l Ear-coverts.
m Chin or mentum.
n Throat.
o Breast.
p The body
q Belly or abdomen.
r Vent.
s Under-tail coverts.
t Interscapularies or back.
v Lower back.
w Rump.
w2 Upper-tail coverts.
x Tail feathers.
z Central or median tail feathers.
aa Lateral tail feathers.
bb Shoulder of wing.
cc Shoulder joint, (lesser wing coverts.)
dd Axilla, or edge of wing.
ee Spurious wing, or primary coverts.
ff Scapulars.
gg Thigh or tibia.
hh Tarsus.
ii Toes.

1 Lesser coverts.
2 Median coverts.
3 Greater coverts.
4 Primaries.
5 Secondaries.
6 Tertiaries.
7 Festoon.
8 Cere.

Adult.—Glossy black, inclining to brown on lower back and rump, some of the scapulars also washed with brown. Quills black, the shafts white, becoming brownish towards the tips. Secondaries whity-brown, blackish towards their tips. Tail black, shaded with brown, the shafts brownish. Crop patch black. A circlet of white down across the breast, and a patch of white above the thigh joint. Under parts of body deep black. Inner face of thighs bare. A small black ruff round the neck, the feathers impending and partially concealing the bare patches on each side of the breast. Bill black; legs dull red; iris reddish brown.

Length.—31 to 33 inches, culmen 2·5, wing 24·5, tail 10 to 11, tarsus 4·1.

Hab.—This is spread nearly all over the continent of India and not unlike *V. monachus* affects the hilly districts in Sind. It is a permanent resident in the province, and is said to breed on inaccessible cliffs from January to April.

Gen. **Gyps.**—*Savigny.*

Tarsus shorter than middle toe; 14 tail-feathers; nostrils perpendicular, rather oval.

Gyps fulvescens, *Hume, Rough Notes*, p. 19; *Str. F.*, vol. vii., p. 322; i., p. 149; *Ibis*, 1869; *Sharpe, Cat. Acc. Br. Mus.* (Sub-Sp. B.), p. 7; *Murray, Hdbk., Zool., &c., Sind*, p. 102.—THE BAY VULTURE.

Adult.—Top of head, cheeks, chin and throat covered with dingy, yellowish-white hair-like feathers. Nape and whole of neck (except the back and basal one-fifth or less) also covered, but with dense, fur-like yellowish-white down. Crop patch pale wood brown, or dark brown; rest of under surface rufous or fulvous brown, with conspicuous whitish central stripes, the under wing coverts darker. Upper back, whole of upper wing coverts, and all but the longest scapulars, rufous ashy, or brownish rufous fawn. Secondaries, tertials, and longer scapulars umber brown. Lower back and rump brown, with distinct central streaks of fulvous white, the upper tail coverts more rufescent. Quills brownish black, the primaries shaded with ashy grey, the secondaries externally washed and tipped with rufous ashy. Tail black, the feathers somewhat shaded with brown on their margins. Feathers of the ruff lanceolate, brown or rufous fawn, mesially streaked with whitish.

Length.—41 to 47 inches, expanse 94 to 106, wing 27 to 30, tail 12·5 to 13·5, culmen 3·7, tarsus 3·88 to 4.

Hab.—Sind, Punjab, N. W. Provinces and the Himalayas. Recorded in *Stray Feathers* from Kutch, Kattiawar, Guzerat, and Rajputana. Breeds during February and March on lofty trees, laying a single white, unglossed and unspotted egg.

Gen. **Pseudogyps.**—*Sharpe.*

Tarsus shorter than middle toe. Tail of 12 feathers.

Pseudogyps bengalensis, *Sharpe, Ann. Nat. Hist.* (4) xi., p. 133; *Cat. Acc. Br. Mus.*, p. 11. Gyps bengalensis, *G. R. Gray*,

Gen. of B. i, p. 6; *Jerd. B. of Ind.*, vol. i, p. 90; *Hume, Str. F.*, vol. v., p. 245; *Murray, Hdbk., Zool, &c., Sind*, p. 104; *Gidh.*, Hind and Sind.—THE BENGAL or COMMON BROWN VULTURE.

Adult.—Cinereous black above, beneath dark brown, the shafts narrowly streaked with fulvous. Lower back and rump white. Ruff scanty, whitish. Head and neck bare with a few dull brown bristles on the crown and nape. Quills, tail, and crop patch black. Under wing-coverts white. Cere horny black; legs dusky black; iris red brown.

Length.—30 to 35 inches, wing 23 to 23·5, tail 10 to 11, tarsus 4·2, culmen 3·1.

Hab.—Throughout India. It is a permanent resident in Sind, and breeds from November to February or later, laying ordinarily one or two glossless white eggs, at times with rusty markings at the larger end.

Sub-Family, NEOPHRONINÆ,—SCAVENGERS.

Bill lengthened, slender; nostrils longitudinal, nearly in the middle of the bill, perforated, and without bony septum.

Gen. **Neophron.**—*Savigny.*

Characters, same as those of the family.

Neophron ginginianus, *Lath. Ind. Orn.* i, p. 7; *Blyth, Ibis*, 1866; *Jerd. B. of Ind.* i, p. 12; *Sharpe, Cat. Acc. Br. Mus.*, p. 18; *Hume, Str. F.* vol. i., p. 150; *Rough Notes* i, p. 39; *Murray, Hdbk., Zool., &c., Sind*, p. 105.—THE WHITE SCAVENGER VULTURE or PHARAOH'S HEN of BRUCE.

Adult.—Yellowish or creamy white. Quills black, neck hackles long, lanceolate, tinged somewhat rusty; secondaries dark brown and, like the quills, internally ashy white at base. Head bare, throat with a little scanty down; a few white feathers in front of the eye. Irides reddish brown; cere and face turmeric yellow; bill pale horny-brown; feet and legs yellowish-white.

Length.—21 to 22 inches, wing 15·5 (not reaching the tip of the tail), tail 9·5, tarsus 3·4.

Hab.—Throughout India and a permanent resident. Breeds from February to April on cliffs, old mosques, &c., seldom on trees, making a rude nest of twigs lined with rags, &c. Eggs variously coloured, the ground colour usually a dirty white, blotched and smeared with reddish brown, or marked all over with deep red with blotches at the larger end.

Sub-Family, GYPÆTINÆ.—*Bon. and Gray.*—BEARDED VULTURES.

Bill strong, lengthened, compressed, straight. Tip of upper mandible much hooked; nostrils oval, hidden by stiff bristles. Chin with a tuft of black rigid hairs, tarsus feathered to the toes.

Gen. **Gypætus.**—*Storr.*

Characters same as those of the Sub-family.

Gypætus barbatus, *Storr, Alpenreisse* p. 69; *Jerd. B. of Ind.*,

p. 13; *Hume, Rough Notes,* vol. i, p. 35; *Murray, Hdbk., Zool., &c., Sind,* p. 105. Falco barbatus, *Gm. S. N.,* vol. i. p. 252. Gypætus hemalachanus, *Hutton, Jour. As. Soc. Ben.,* vol. vii. p. 22. Gypætus orientalis, *Blyth, Ibis,* 1863.—The Bearded Vulture or Lammergeyer.

Adult.—Above black, a few brown feathers on the rump; quills brown, externally washed with ashy, the secondaries with ochreous brown, the shafts of all the feathers white, feathers of the back also white shafted, tinged with buffy, especially on the wing-coverts. Head white, with dark streaks; nape feathers lanceolate elongate, tinged with bright tawny; cheek stripe and supercilium black; bristles over the nostrils and tuft of hairs under the chin black. Entire lower parts rich tawny, dull orange, or ferruginous; a dark pectoral collar (not always present) more or less distinct. Under wing-coverts dark brown with pale shaft-streaks. Bill bluish horn, the tip darker; feet plumbeous; iris pale orange, sclerotic membrane blood-red.

Length.—45 to 46 inches, expanse 108 to 112, wing 29·5, tail 20, tarsus 4, culmen 3·7.

Hab.—The highest mountains of Europe, Asia, and Africa, principally the most inaccessible parts; also the Himalayas from Nepaul to Cashmere, and the Salt and Sooliman Ranges; not uncommon in the Bolan (Beloochistan) and South Afghanistan.

The Lammergeyer is not common in any part of Sind, except the northern country, at and beyond Jacobabad, affecting the hilly districts. Whether it is a permanent resident of those parts or only a winter visitant, is not known. Mr. Hume, in his contributions to the Ornithology of India, &c., in *Stray Feathers,* states that he observed it on two occasions in the hills dividing Sind from Khelat. Dr. Day observed it in Durryah, and it is said to be well known to sportsmen who have shot ibex in those ranges.

It does not possess the carrion-eating propensities of the other vultures, but kills its own game, comprising ibex, hares, &c.

Family, FALCONIDÆ,—Falcons.

Bill usually short and compressed; tip elongated, curved and sharp. Commissure of upper mandible distinctly toothed or festooned. Head always covered with true feathers.

Sub-Family FALCONINÆ,—True Falcons.

Wings long, second quill usually longest, legs reticulated.

Gen. **Falco.**—*Linn.*

Nostrils round with a central tubercle. First one or two quills notched internally, second quill longest; tarsus feathered at the knee; toes long, scutellated.

Falco peregrinus, *Gmel. S. N.,* vol. i. p. 272; *Jerdon, Birds of India,* vol. i. p. 21; *Ibis,* 1871; *Gray, Cat. Br. Mus.,* p. 11; *Hume, Rough Notes,* vol. i. p. 49; *Sharpe, Cat. Acc. Br. M.,* p. 376; *Murray, Hdbk., Zool., &c., Sind,* p. 106. *Bhyri* (the female), *Bhyri Bacha* (the male), Hind.—The Peregrine Falcon.

Adult Male.—Above bluish grey, paler on the rump and upper tail-coverts, and barred with blackish. Head, neck, upper part of mantle and wing-coverts blackish, with grey barring more or less indistinct on the latter. Cheeks, ear-coverts, and a short moustachial band blackish. Forehead, sides of neck, chin, throat, under surface of body and breast white, the latter with a tinge of pale fawn, as also the lower abdomen; the chest with a few narrow black shaft-stripes almost disappearing in old individuals; abdomen with some small heart-shaped spots, some similar marks on the under-tail coverts also. Thighs transversely barred with narrow black lines. Quills brownish black, primaries slightly shaded with greyish, the secondaries clearer grey, crossed by dull blackish bars, the smaller median quills tipped white. Tail feathers greyish, broadly barred with black and tipped with white. Bill bluish, black at the tip; cere, legs and feet yellow; claws black; iris hazel-brown.

Length.—15 to 16 inches, culmen 1·2, wing 12·2 to 12·7, tail 6·5 (*Adult female* similar to the adult male, but larger; *length*, 17 to 19, culmen 1·35, wing 14·5, tail 7·5, tarsus 2·3.)

The young bird is brown, all the feathers edged with pale buff shading into whitish; under surface of the body whitish, the throat unspotted, all the rest of the feathers dark brown in the centre, lower flanks barred; head more edged with whitish; cheek stripe brown. Wings darker than the back; the inner webs spotted or barred with rufous. Tail feathers brown, broadly tipped with white; the outer web spotted and the inner one barred with pale rufous more or less distinct.

Hab.—Nearly throughout India, Europe, Nepaul and Persia. A winter visitant to the Province, arriving about the middle of November and leaving at the latter end of January.

Falco saker, *Gm. Syst. N.* i, p. 273; *Tristram, Ibis,* 1859, p. 284; *Jerd. B. of India*, vol. i, p. 29; *Hume, Str. F.*, vol. i. p. 152; *Rough Notes*, i, p. 62. Hierofalco saker, *Sharpe, Cat. Acc. Br. Mus.* i, p. 417; *Murray, Hdbk., Zool., &c., Sind.* F. lanarius, *Pall. Zoog. Rosso-As.*, vol. i, p. 330; *J. E. Gray, Cat. Mam. and Birds, Nepaul*, p. 43. *Cherrug* Hind. (female), *Chargela* (male), Hind.—THE CHERRUG FALCON.

Adult Male.—Above pale earthy or slaty brown; all the feathers margined with rufous. Head pale rufous, reddish ash or bleached nearly white; the feathers with narrow mesial streaks. Chin, throat, abdomen, and under tail-coverts white; cheek stripe indistinct; breast and lower parts white, with oblong slaty spots, more thickly on the breast and flanks; quills brown, deeply indented with white or rufous-white notches or bars, less in number on the secondaries; tail pale brown, barred with whitish on the inner web, and ovally spotted on the outer. Thighs streaked with brown. Under wing-coverts and axillaries white, streaked with brown; cere greenish white; orbits and feet yellow.

Length.—18 to 18·5 inches, wing 12·5 to 13·2, tail 7·3 to 7·5, culmen 1·2, tarsus 2; *Female*, 20 to 24 inches, wing 14 to 15·8, culmen 1·3, wing 15·8, tail 9·8, tarsus 2·1.

Hab.—The whole continent of India from Cape Comorin to the Himalayas, (Bengal, Sind, Punjab, N. W. Provinces and Kutch,) affecting open plains. Outside of India it is found in Asia Minor, Egypt, Nepaul and Yarkand.

It is not common in Sind, and occurs during winter only, arriving at the same time as *F. peregrinus*, but of its departure nothing is on record. All specimens obtained in Sind are in the young or immature phase, with the upper parts brown, the head a yellowish white colour, and the body beneath brown.

Falco juggur, *J. E. Gray, Ill. Ind. Orn.* ii. pl. xx.; *Cat. Mammals, and Birds Nepaul*; *Hume, Rough Notes*, vol. i, p. 70; *Str. F.*, vol. i. p. 152; *Sharpe, Cat. Acc. Br. Mus.*, p. 393; *Murray, Hdbk., Zool., &c., Sind.* Falco luggur, *Jerd. Madras Journ.* x. p. 80; *id. Ill. Ind. Orn.* pl. xliv. 1847. *Lugger* (female), *Juggur* (male), Hind—THE LUGGUR FALCON.

Adult Male.—Above dusky ashy or slate colour; crown of head dull rufous with central ashy black striations. Lores, forehead, chin, throat and eyebrow white, moustachial stripe black; wing-coverts concolorous with the back, the carpal margin white. The breast white with a few brown spots. Lower abdomen, flanks, and thighs ashy brown. Tail clear ashy grey with pale rufous bars on the inner webs and a white tip.

Length.—15·5 to 17 inches, wing 11·8, tail 7, tarsus 1·95, culmen 1. *Female* 17 to 19 inches, wing 13·6 to 15·5, tail 8 to 8·5, tarsus 1·95 to 2.

Young, of a chocolate brown above and below; wing-coverts with rufous margins. Head yellowish-fawn or pale rufous. Forehead and eyebrow whitish. Chin and throat white. Under tail-coverts dirty white with faint brown markings.

Hab.—Throughout India and Nepaul. Breeds in Sind from February to April on mosques, church steeples, trees, or cliffs of rocks, laying 2 to 4 white eggs thickly spotted and speckled all over with a brick-red or reddish brown colour.

Falco babylonicus, *Gurney, Ibis*, 1861, p. 218, pl. vii.; *Jerd. B. of Ind.*, vol. i, p. 32; *Ibis*, 1866, p. 221; *Hume, Rough Notes*, i, p. 79; *Sharpe, Ibis*, 1870; *Cat. Acc. Br. Mus.*, p. 388; *Str. F.*, vii. p. 329; *Murray, Hdbk., Zool., &c., Sind.*—THE RED-HEADED LANNER.

Young Male.—Dark earthy brown, some of the feathers of the crown obscurely margined, the nape and hind neck mottled, the lower back and rump edged, and the upper tail-coverts also barred with rufous. Tail dark brown, spotted on the outer web and banded on the inner one with rufous, the two centre feathers nearly obsoletely barred. Quills dark brown, barred with pale buff on the inner web; the secondaries paler brown, edged and spotted on the outer web with rufous. Feathers under the eye and cheek stripe blackish brown. Sides of the face

and ear-coverts strongly tinged with rufous; throat whitish; rest of under surface earthy buff, with central dark brown streaks to the feathers inclining to bars on the vent and under tail-coverts. Under wing-coverts brown, spotted and barred with clear buff. Cere pale sea green; bill pale bluish-green, blackish on the culmen and tip; feet bright yellow; iris dark brown.

Length.—15·5 to 16 inches, wing 11·87 to 12, tail 6 to 6·6, tarsus 1·9.

Adult Male.—Above bluish grey, the feathers with pale fulvescent margins, and having indistinct bars of darker grey; the lower back, rump and upper tail-coverts paler and clearer blue grey, transversely barred with dark grey, the bars somewhat irregular and arrow-shaped on the upper tail-coverts. Wing-coverts concolorous with the back, the greater series rather lighter grey. Quills brown, externally shaded with grey; the secondaries margined and broadly tipped with buffy white, and barred across with darker grey, the bars very distinct on the lower surface of the wing and especially numerous on the primaries. Tail grey, tipped with fulvous and crossed with nine or ten bars of darker grey, the light grey interspaces sometimes tinged with rufous, the lower surface of the tail whitish, the bars very distinct. Head and hind neck clear rufous, the crown more or less inclined to greyish black, of which colour many of the feathers are composed, having only a slight margin of rufous. A rufous half collar round the back of the neck, mottled somewhat with slaty. Sides of the face buffy white, tinged with rufous; the ear-coverts streaked with brown, collecting on the cheeks and forming a distinct moustache. Throat pure white; chest also white, with a few narrow central streaks of brown; remainder of under surface whitish, slightly tinged with buff and numerously marked with arrowhead spots of brown in the centre of the body, and barred on the sides of the breast, flanks, and under wing-coverts with the same colour. The bars on the thighs and under tail-coverts narrower than on the greater series of the under wing-coverts. Cere, gape, orbits and feet bright yellow; bill bluish, blackish at the tip; iris deep brown.

Length.—17·25 inches, wing 13, tail 7·25, tarsus 1·75.

Hab.—The Punjab, Beloochistan and Persia, N. W. Provinces, Nepaul, N. E. Africa, Mesopotamia, Central Asia. It is said to breed in Cashmere. A winter visitant. Not uncommon from November to February in Sind.

Falco barbarus, *Linn. Syst. Nat.* i, p. 125; *Salvin, Ibis,* 1859; *Heugl. Orn. Afrik.* i, p. 21; *Hume, Str. F.*, i. p. 19; *Saunders, P. Zool. Soc.*, 1872, p. 356; *Sharpe, Cat. Acc. Br. Mus.*, p. 386; *Murray, Zool., &c., Sind,* p. 107; Falco pelegrinoides, *Tem. pl.* col. 479; *Gray, Gen. B.* i, page 19.—The Barbary Falcon.

The forehead presents a mixture of rufous and dull white. This part of the head is encircled by a black (or dark slaty) horse-shoe shaped band, of which the lateral branches pass over the eyes, their

extreme points joining in front of the eyes, the moustachial stripes, which extend along the sides of the neck. The occiput and nape are covered by a rufous half collar marked with three black spots, of which the centre one forms a band on the nape. The back and wings are a light bluish grey, with large spots and irregular bars of bluish black.

The tail which is a lighter grey than the back, is barred transversely with black bands, very narrow towards the bases of the feathers, but widening gradually towards their ends, the tips of which are white. The chest is pure isabelline. The flanks, vent and abdomen of the same colour, but the feathers bear very narrow longitudinal striæ and little triangular black spots. The base of the beak is yellow, but the point blue. The cere and feet beautiful yellow, and the orbital skin orange. (*Tem. Ex. S. F.* 1·19).

Length.—Female 15·5 inches, expanse 36·4, wing 11·4, tail 6·4, tarsus 1·8. Male 14 inches, wing 10·8, tail 5, tarsus 1·6.

Hab.—Sind (winter visitant), Persia, Kutch, and the Central Provinces. *Sharpe* (*Cat. Acc*). gives its range as N. and N.E. Africa as well as Senegambia on the West Coast, ranging into N.W. India and the Himalayas.

Falco subbuteo, *Linn. Syst. Nat.* i, p. 127; *Gould, B. Eur.* i, pl. 22; *Blyth, Ibis*, 1863, p. 9.; Hypotriorchis subbuteo, *Boie, Isis*, 1826, p. 976; *Gray, Gen. B.* i, p. 20; *Jerd. B. Ind.* i, p. 33, No. 13; *Hume, Rough Notes*, i, p. 85, *Stray* F. ix. 282.—The Hobby.

Adult Male.—Top of head, back, scapulars and wing-coverts bluish black, the latter sometimes tinged with rusty; lower back and rump clear slaty grey. Forehead and eyebrow, whitish; nape tinged with rufous, forming two indistinct rufous spots. Lores, cheek stripe, feathers below the eye and ear-coverts black. Throat and sides of the neck, creamy white, tinged with rufous, the breast and abdomen the same, streaked mesially with dark brown, narrow on the centre of the abdomen, and wider on the flanks; vent, under tail-coverts and thigh-coverts rich ferruginous. Under wing-coverts buffy white with some transverse dark bars. Quills blackish, barred internally with rufous. Tail dark slaty or slaty grey, barred on their inner webs with rufous, and tipped with whitish.

Length.—11 to 11·5 inches, wing 9·5 to 9·6, tail 5·5, tarsus 1·25. Females are larger; *length* 13·5, wing 10·6, tail 6·5, tarsus 1·4.

The young bird is dark or grey brown above, the feathers edged with fulvous. Cheek stripe darker. Forehead and superciliary fulvous white; sides of the neck, nape, throat, and under surface creamy buff; lower abdomen and thigh-coverts with a rufous tinge, and streaked mesially with brown. These streaks are rather broad and distinct on the breast, and long and narrow on the under tail-coverts. Wings and tail as in the adult; black, and banded with rufous.

Hab.—The whole of Europe and Northern Asia, extending to India and North China, and migrating in winter to South Africa (*Sharpe*). In India it has been found in Nepaul and Darjeeling, and Jerdon killed one at Jaulnah. In Sind it was obtained by Mr. S. Doig at Hydrabad in the month of June.

Falco æsalon, *Gmel. Syst. Nat.* i. p. 284; *Heugl. Orn. N. O. Afric.*; Hypotriorchis æsalon, *Gray. Gen. B.* i. p. 20.; *Jerd. B. of Ind.* vol. i. p. 35. Lithofalco æsalon, *Hume, Rough Notes*, i. p. 89; *Jerd. Ibis*, 1871, p. 242; *Murray, Hdbk., Zool., &c., Sind*, p. 108. Falco regulus, *Pall Reis. Russ. Reichs* II. *Anhang*, p. 707; *Gmel. Syst. Nat.* i. p. 285; *Sharpe, Cat. Acc. Br. Mus.*, p. 406.—THE MERLIN.

Adult:—Above clear slaty blue, paler on the rump and upper tail-coverts, the black shafts on all the feathers distinctly indicated. Head dark slaty, with broad shaft-stripes; forehead, lores and sides of the face whitish, the feathers with dark mesial streaks. Eyebrow and nape strongly mixed with rufous. Ear-coverts tinged with grey on the hinder part; chin and throat pure white. Sides of the neck and entire under parts white, washed with rufous, the feathers dark shafted; under wing-coverts white, spotted and barred with black. Quills black, the inner web barred with greyish white and the outer washed with bluish grey near the base. Inner secondaries concolorous with the back, dark shafted. Tail slaty blue, tipped with white, with a broad subterminal black band. Cere yellow; bill bluish horn colour, darker at the tip; feet yellow; iris dark brown.

Length.—Male, head and body 10 to 11·25 inches, wings 7·75 to 8, tail 4·5 to 5, tarsus 1·45. Female browner in colour, under surface less rufous; *length* 12 to 13 inches.

The young bird is like the adult female in colour, but tinged grey, with dark shafts and rufous edges to the feathers; the head rufous, with dark streaks, the tail ashy brown, barred with rufous and with a white tip.

Hab.—Sind, Kutch, Punjab, Beloochistan, and Afghanistan. The whole of Europe and Northern Asia, extending into India and China.

Falco chiquera, *Daud. Traite*, ii. p. 121; *Blyth, Cat. Mus. As. Socy. Beng.* p. 14; *Sharpe, Cat. Acc. Br. Mus.* p. 403. Hypotriorchis chiquera, *Gray, Gen. B.* i. p. 20; *Jerdon, B. Ind.* i. p. 36, No. 16; *Murray, Hdbk., Zool., &c., Sind*, p. 108. Chiquera typus, *Bp. Rev. et Mag. de. Zool.* p. 536, 1854; *Hume, Str. F.* i. p. 157. Lithofalco chiquera, *Hume, Rough Notes*, i. p. 91; *Anderson. P. Z. S.* 1871, p. 681. The *Turrumti*, Hind.—THE RED-HEADED MERLIN.

Adult Male.—Crown, nape and neck, and sides of the neck chestnut; forehead white; sides of the face, chin, throat and neck white, except a faint, short, moustachial stripe. Eyebrow and a narrow streak below the eye, black; back, scapulars, tertiaries, wing and primary coverts and secondaries slaty blue, the feathers with dark shafts and barred with dark brown. Primaries dark or blackish brown, their inner webs barred with white. Under wing-coverts white, barred with blackish brown; breast white, some of the feathers with dark shaft-streaks; rest of under surface white, barred transversely with black. Tail like the back, the feathers barred with black, tipped white and with a broad subterminal black band. Cere, orbits and feet yellow. Claws black; bill greenish yellow at base, black at the tip; irides light brown.

Length.—11·5 to 12 inches, wing 8·25, tail 4·75 to 6, tarsus 1·5, culmen 0·85.

The adult female is similar to the male, but larger; *length* 13 inches, wing 9, tail 6·5, tarsus 1·5 to 1·55.

Hab.—Sind, Punjab, N. W. Provinces, Bengal, Nepaul, Kutch, Kattiawar, Jodhpore, N. Guzerat, and throughout the Indian Peninsula; also Beloochistan, Persia and Afghanistan.

Affects open country in the vicinity of cultivation. It is said to be easily reclaimed and flown at partridges and quails, which it pursues very perseveringly. Like the European sparrow-hawk, it is a very courageous bird, and the propensity of attacking larger birds of prey than itself seems to be more developed. Jerdon says it even drives away the *Wokhab* (*Aquila fulvescens*) from the vicinity of its nest or perch.

Cerchneis tinnuncula, *Boie, Isis*, 1828, p. 314; *Sharpe, Cat. Acc. B. M.* p. 425. Tinnunculus alaudarius, *Gray, Gen. Bird*, i. p. 21; *Jerd. B. Ind.* i. p. 38, No. 17; *Blyth, Ibis*, 1863; *Hume, Rough Notes*, p. 96; *Murray, Hdbk., Zool., &c., Sind*, p. 108. (*Narzi*, the female; *Narzanak*, the male, Hind.)—The Kestrel.

Adult Male.—Forehead buffy white; crown of the head, nape, neck behind and on the sides, blue grey, the feathers with narrow dark shaft-stripes. Eyebrow buffy white; sides of the face, except a dark moustachial stripe, silvery white; chin and throat, also the under tail-coverts, unspotted buff. Upper back, scapulars, tertiaries and wing-coverts, brick-red or vinaceous, the feathers with a subterminal heart-shaped black spot, larger on the tertiaries. Primaries and their coverts, and secondaries dark brown, the primary coverts margined with rufous, outer secondaries narrowly edged and tipped with fulvous or buffy white, and the primaries barred on their inner webs with white; the inner primaries with bars of a rufescent hue. Lower back, rump, upper tail-coverts and tail blue grey, the tail with a broad subterminal black band and tipped with white; breast, abdomen, and flanks, rufous fawn, the feathers on the breast and flanks with mesial dark streaks, which take an oval shape lower down. Thigh-coverts unspotted rufous fawn. Under wing-coverts white, with a buffy tinge, and spotted black. Bill bluish-horn, black at the tip and yellowish at the base. Cere, orbits and legs yellow. Irides brown.

Length.—12·5 to 13 inches, wing 9·5 to 10, tail 6·5 to 6·7, culmen 1·75, tarsus 1·6.

The adult female is less rufous in colour above, and with the subterminal spots wider and forming bands. Head rufous with longitudinal streaks. Tail rufous, banded with dark brown, tipped with white and with a subterminal black band as in the male.

Hab.—The whole of Europe and North Asia; the Indian Peninsula as a winter visitant; N. E. and South Africa, Sind, Punjab, N. W. Provinces, Oudh, Bengal, Kutch, Kattiawar, and along the Western Coast; Central and Southern India to Nepaul; also Beloochistan, Persia, Afghanistan, and Eastern Turkistan.

A very useful bird to cultivators, preying only, as it does, chiefly on field-mice, which are its favourite diet.

Gen. **Astur**.—*Gm.*

Bill broad at base, compressed to tip, festooned in the middle. Nostrils oval, situated anteriorly in the cere. Wings long; 3rd, 4th, and 5th quills longest. Tarsi long, scutate.

Astur badius, *Kaup. Isis*, 1847; *Sharpe, Cat. Acc. Br. Mus.* p. 109, (Sub-Sp. A.). Micronisus badius, *Bp. Consp.* i. p. 33; *Jerd. B. Ind.* i. p. 48, No 23; *Blyth, Ibis*, 1863; *Hume, Rough Notes*, p. 117; *Murray, Hdbk., Zool., &c., Sind*, p. 108. Accipiter badius, *Strickl. Ann. Mag. N. H.* xiii. p. 33.—The Shikra or Brown Hawk.

Young.—Head, nape, neck behind, back, scapulars, wing and upper tail-coverts ashy, dusky, or pale earthy brown, the feathers on the head slightly darker, and all edged with pale rufous, the feathers of the neck with their white bases showing through. Lores and eyebrow white; sides of the face and ear-coverts pale brown, tinged with rufescent and mesially streaked with darker; chin and throat white, with a mesial dark brown throat stripe; breast and abdomen whitish with large longitudinal drops—oval on the upper breast,—of a pale rufous colour. Vent and under tail-coverts white; under wing-coverts buff, streaked and barred with dark brown; thigh-coverts also barred. Primaries brown, their inner webs buffy, and barred with dark brown; secondaries brown, barred darker on both webs and margined and tipped with buffy. Tail ashy brown with 5—6 broad dark brown bands; narrower and about nine on the outermost feathers, the interspaces and tips of all buffy white. Cere yellow; bill dusky with a bluish tinge. Iris pale yellow; feet yellow.

In the adult plumage the upper parts are bluish grey; the nape is mottled with white, and the white bases of the scapular feathers show through in some specimens; the primaries are dusky black, with their inner webs of a buff colour and barred darker brown, nearly black; the secondaries are bluish grey and also barred. The tail is ashy grey, and tipped with white, the bars on the lateral tail feathers 9—11 in number, and of a dark brown colour. The throat stripe is less distinct than in the young, and the entire lower surface is barred with white and rufescent brown. The abdomen, thighs and under tail-coverts, unspotted white; rest as in the young. The adult female is like the male but larger.

Length.—Adult Male 13·5 inches, wing 7·9, tail 6·3, tarsus 2.

Adult Female.—Length 14·5, wing 8·3, tail 6·4, tarsus 2·15.

Hab.—The Indian Peninsula generally, and Ceylon, extending to Assam and Burmah, and also to Beloochistan, Persia and Afghanistan. Breeds in Sind during April. It is commonly trained by natives, being easily reclaimed and expert in striking a quarry.

Gen. **Accipiter**.—*Briss.*

Bill short, much compressed, festooned. Nostrils oval, rather oblique, situated on the forepart of the cere, and partly hidden by setæ. Wings moderate, rounded, and with the 4th and 5th quills longest. Tarsi long.

Accipiter nisus, *Lin. Syst. Nat.* i. p. 130; *Pall. Zoogr. Rosso. As.* i. p. 370; *Gray, Gen. B.* i. p. 29; *Jerd. B. Ind.* i. p. 51, No. 24; *Hume, Rough Notes*, i. p. 124; *Sharpe, Cat. Acc. Br. Mus.* p. 132; *Murray, Hdbk., Zool., &c., Sind.*, p. 110. (*Basha*, the female; *Bashin*, the male, Hind.)—The European Sparrow-Hawk.

Young.—Head, nape, neck behind, back, scapulars, and wing-coverts dusky brown, darker on the upper back, the feathers margined with rufous, the occiput and nape with white mottlings, caused by the broad white bases of the feathers showing through. Lores and eyebrow white; chin and throat and sides of the neck white, the feathers with mesial dark streaks. Ear-coverts the same. Rump and upper tail-coverts like the back, the feathers with dark shafts and tipped rufous. Primaries and secondaries dusky brown, basally rufescent white on their inner webs and barred with dark brown. The tips of the secondaries rufous or rufescent white; inner web subterminally of the tertiaries white, margined at the tips with pale rufous. Tail ashy brown, above greyish white, on the under surface tipped whitish and with fine dark brown bands; breast, abdomen, flanks, and thigh-coverts barred with rufous brown and white. Under tail-coverts white. Under wing-lining buff, with spots and transverse dark brown bars.

Adult Male.—Head, nape, hind neck, wing-coverts, back, and scapulars, slaty, with a bluish tinge, the nape mottled white, and some of the tertials basally white. Upper tail-coverts and scapulars with indistinct dark shafts. Tail, like the back, tipped white, and with four dark brown bands. Primaries dark brown, their inner webs rufescent white, and crossed with darker brown, nearly black bars; secondaries slaty, also rufescent white on their inner webs and barred across with dark brown. Chin and throat white, with a rufous tinge; breast, flanks, and abdomen barred with bright rufous and white. Thigh-coverts the same. Under tail-coverts white. Under wing-coverts barred with rufous and dark brown. Bill horny or dark horn-blue; cere, base of lower mandible and legs, yellow; iris orange.

Length.—13 inches, wing 8·15, tail 6·3, tarsus 2·3. *Females* larger and of a duller tint; *length*, 15·5, wing 9·3 to 9·5, tail 7, tarsus 2·5.

Hab.—The whole of Europe and Northern Asia, extending in winter into Algeria, N. E. Africa, the Indian Peninsula, and China (*Sharpe*). Occurs throughout Sind, Punjab, N. W. Provinces and Bengal; also throughout the Western Presidency and in Beloochistan, Persia and Afghanistan. Affects gardens and cultivation. It is much used in Sind for hawking, and is said to be easily tamed, and owing to its courage, a better bird than the Shikra for the quarry.

Sub-Family, AQUILINÆ,—Eagles.

Bill strong, more or less lengthened, festooned, but not toothed. Tarsi long, reticulate behind. Wings moderate, 4th quill usually the longest.

Gen. **Aquila**.—*Briss.*

Bill straight at the base, very much curved at the tip. Sides compressed. Wings, 4th and 5th quills longest and equal. Tarsi feathered to base of toes.

Aquila chrysætos, *Lin.*; *Dumont, Dict. Sci. Nat.* i. p. 339; *Jerd. B. Ind.* i. p. 55, No. 26; *Stray Feathers*, i. p. 157; *Sharpe, Cat. Acc.* p. 236. Aquila fulva, *Sav. Descr. Ois. De Egypt*; *Shelley, B. Egypt.*—The Golden Eagle.

Adult Male.—Crown of the head brown; nape and hind neck pale orange brown, the feathers lanceolate, with brown bases; sides of the face paler. Lores greyish white. Cheeks blackish. Back, scapulars and wing-coverts dark brown, the latter and scapulars margined slightly paler. Greater wing-coverts with brownish mottlings. Primaries dark brown, blackish towards their tips, basally white on their inner webs and clouded or mottled with brown. Tail nearly square, the middle feathers slightly elongated. At the tip it is dark brown or nearly black, greyish basally; the intervening space brown and much mottled. Under surface of body dark brown; the thigh, leg and under wing-coverts pale brown, tinged or washed with tawny. Cere yellow. Bill bluish-horn colour, darker at the tip. Legs yellow. Irides hazel.

Length.—35·5 to 40 inches, wing 24·5 to 28, tail 14 to 17, tarsus 3·8 to 4·5. The young has the plumage of a lighter shade. The feathers of the back, scapulars and tertials brown, basally broadly white and showing through. The tail broadly black terminally, white or ashy at the base, and mottled with brown. Under suface of body light brown, the feathers basally white. The thigh and under tail-coverts tawny rufous. *Adult female* is larger than the male.

Hab.—The whole of Europe and N. Asia, extending into India and N. China. Has been found in the Punjab, and in the Himalayas. In Sind it occurs on the hills dividing Sind from Khelat; also in the Bolan, Beloochistan, and probably extends into Persia and Afghanistan.

Aquila heliaca, *Savign. Desc. Egyp.* p. 459; *Gould. B. Eur.* pl. 5; *Gray, Gen. B.* i. p. 13, *Sharpe, Cat. Acc.* p. 238. Aquila imperialis, *Cuv. Regne. Anim.* i. p. 325; *Gray, Ill. Ind. Zool.* ii. p. 28; *Jerd. B. of Ind.* i. p. 57, No. 27; *Hume, Rough Notes*, i. p. 142; *Stray Feathers*, i. p. 157; *Murray, Hdbk., Zool., &c., Sind.* p. 109. Aquila mogilnik, *Strickl. Orn. Syn.* p. 57 (*S. G. Gmel.*). Aquila bifasciata, *Saund. P. Z. S.* 1871.—The Imperial Eagle.

Young.—Above rather light brown, the back feathers mostly shaded down the middle with ashy and on the margins with purplish; all the feathers of the upper surface pointed with buffy fawn colour, giving a spotted character to the plumage; head and neck tawny buff, the feathers with clear brown bases, which show through more or less and impart a streaked appearance; the plumes of the hind neck long and lanceolate, brown like the back, with tawny streaks down the centre; wing-coverts brown, pointed with fulvous like the back; the greater and median coverts with broad buffy-white terminal spots,

widening up the shafts of the feathers; quills blackish; the secondaries rather browner, and broadly tipped with buffy-white; feathers of hinder back and rump tawny fulvous, with dark brown lateral margins, spreading more over the plumes of the latter part; upper tail-coverts buffy-white, in strong contrast to the tail, which is uniform brown, tipped with buffy-white; under surface of tail light tawny fulvous, nearly uniform on the throat, abdomen, thighs, tarsus and under tail-coverts; the whole of the breast feathers laterally margined with brown, producing a distinctly streaked appearance; under wing-coverts rufous fawn colour, streaked with brown; the lower series ashy brown, like the inner lining of the wing.

Adult Male.—Blackish brown above, much lighter brown on the under part of the back and on the upper tail-coverts, which are mottled with white near the base, and broadly tipped with the same; many of the scapulars pure white, forming a conspicuous patch, which, however, is confined to the scapulars themselves; the last wing-coverts slightly mottled with brown, but not with white near the carpal bend; rest of wing-coverts blackish brown, uniform with interscapulary region; quills blackish; the primaries externally shaded with ashy grey; the secondaries browner; the innermost slightly tipped with buffy white; the lower surface of wing ashy brown; the primaries mottled with whitish at base of inner web. Tail ashy grey for a little more than the basal two-thirds, shaded with silvery grey, and mottled with blackish brown, forming indistinct and broken bars on some of the feathers; the terminal third blackish brown with a narrow tip of fulvous; head and neck light fulvous with fawn coloured bases to some of the feathers of the nape. Hind neck dark fawn brown with light buff tips and dark brown centres; forehead and anterior part of crown blackish, as well as the feathers over the eye; sides of face and of neck light fulvous like the crown, the feathers under the eyes inclining to brown. Cheeks and entire under parts blackish; the under tail-coverts tawny buff with dark brown shaft-lines and whitish tips to the feathers; under wing-coverts and axillaries blackish, like the breast. Cere pale yellow. Bill bluish, darker at tip. Feet pale yellow. Iris brownish yellow.

Length, Male.—31 inches, culmen 2·6, wing 22·6, tail 11·3, tarsus 3·9.—(*Sharpe, Cat. Acc.*)

Adult Female—Larger; *length*, 32·34 inches, wing 23·75—24 inches, tail 11·5, tarsus 3·85.—(*Sharpe, Cat. Acc.*)

Hab.—South, Eastern and Central Europe, and throughout India nearly. Occurs in Sind, the Punjab, Beloochistan, Afghanistan, Persia, Concan and Deccan; Nepaul, Behar, Central and Southern India, and the Himalayas.

Aquila clanga, *Pall. Zoogr. Rosso. Asiat.* i. p. 351; *Gray, Hand List,* i. p. 28; *Sharpe, Cat. Acc. p.* 248; *Murray, Hdbk., Zool., &c., Sind.* Aquila vittata, *Hodgs. in Gray's Zool. Miscellany,* 1844. Aquila nævia, *Schrenck. Reis. Amurl. Vog.* p. 220; *Jerd. B. of Ind,* i. p. 29, No. 28; *Hume, Rough Notes,* i. p. 162; *Stray Feathers.* i. p. 158; *Andrs. P. Z. S.* 1871.

Young Male.—Above brilliant purplish brown; head and neck rather duller, with lanceolate apical streaks of dingy buff on the nape and hind neck; wing-coverts purplish brown like back, with a few dull white longitudinal streaks on the median coverts, much larger and forming distinct oval spots on the primary and greater coverts, and tips of the scapulars. Quills blackish; secondaries browner with obsolete blackish bars, and oval markings as the scapulars; lower back and rump with distinct triangular spots of ochraceous buff; the upper tail-coverts almost uniform buffy-white; tail feathers blackish, shading into brown towards the end, and tipped with whity brown with 3—4 black bars near the tips; under surface of body blackish; the chin browner; breast feathers with pale brown mesial streaks, more ochraceous on the abdomen and leg feathers. Under tail-coverts ochraceous buff; under wing-coverts uniform blackish; axillaries browner.

Length.—26—28 inches, wing 20—21, tail 10—10·5, tarsus 3·9.

Adult Male.—Smaller than female; *length* 26—27, wings 20—20·5, tail 10, tarsus 3·6. The female is a powerful bird, and is 29 inches in length, the wing being 21·4, tail 11·8, tarsus 4·2.—(*Sharpe, Cat. Acc.*)

Hab.—Sind, Persia, Punjab, N. W. Provinces, Bengal, Kutch, and Guzerat; also the Concan and Deccan, Malabar, and Southern India. Breeds in Sind during April and May.

Aquila vindhiana, *Frankl. P. Z. S.* 1831, p. 114; *Strickl. Orn. Syn.* p. 59; *Sharpe, Cat. Acc.* p. 244. Aquila punctata, *Gray, in Gr. & Hard. Ill. Ind. Zool.* i. pl. 16. Aquila fusca, *id. op. cit.* ii. pl. 26. Aquila fulvescens, *id. op. cit.* ii. pl. 29; *Jerd. B. of Ind.* i. p. 60, No. 29; *Hume, Rough Notes,* i. p. 173; *Stray Feathers,* i. p. 158; *Murray, Hdbk., Zool., &c., Sind,* p. 109. *Wokhab,* Hind.; *Ukab,* Sind.—The Tawny Eagle.

Young.—Above glossy purplish brown with distinct fulvous tips to the feathers, broader on lower back, rump and upper tail-coverts; head and neck all round and entire under parts greyish mouse colour, with distinct points to all the feathers of the head and neck, absent on the under surface, excepting a few remains on the tips of the abdominal and lower throat feathers; lores and chin whitish, with narrow black shaft-lines, the latter also apparent on the cheeks and ear-coverts, which are mouse grey, like the breast; tarsal feathers and under tail-coverts more fulvescent; under wing-coverts mouse grey with pale fulvous tips; upper wing-coverts ashy brown, with a very slight purplish gloss, but not so dark as the back, nor so grey as the head, though tipped like the latter with fulvous; greater and primary coverts, as well as the secondaries, deep brown, with whitish ends; primaries black, slightly shaded with brown near the base; lower surface of wing ashy brown, blackish towards tips of primaries; the inner webs of all slightly mottled with greyish. Tail purplish brown, tipped with buffy white; all the feathers shaded with ashy grey, forming indistinct bars on the centre feathers, on which remains of eleven or twelve can be counted.

Length.—28 inches, wing 20·75, tail 11, tarsus 3·2.

Adult Female.—General colour fulvous or tawny brown, most of the feathers with lighter margins, especially on the least wing-coverts; the median coverts darker brown, but not so glossy as the back, with fulvous margins; greater and primary coverts, as well as secondaries, tipped with fulvous; primaries blackish, externally shaded with ashy grey, forming distinct bands on both webs, these bands more vermiculated on the lower surface, the inner webs of the quills being ashy brown, shading into deep brown towards the tips of the primaries; tail dark brown, tipped with fulvous, the feathers shaded with ashy grey, forming 8—9 distinct bars on centre feathers; head and neck rather paler than the back, the feathers of the latter part margined with fulvous, giving a very mealy appearance; sides of face also light fulvous; under surface of body pale fulvous brown, lighter on the throat, thighs, and under tail-coverts; under wing-coverts with many of the feathers whity brown on their margins, and near the base, the lower series ashy brown like the inner lining of the wing. Cere and gape deep yellow; feet yellow. Iris hazel brown.—(*Sharpe, Cat. Acc.*)

Length.—27—28 inches, expanse 67—69 inches, wing 19·75—21·75, 4th and 5th primaries longest, tail 11·25—11·5, tarsus 3·3.

Adult Male.—28 inches, wing 20·5, tail 11, tarsus 3·4.—(*Sharpe, Cat. Acc.*)

Hab.—Sind, Punjab, N. W. Provinces, Bengal, Rajputana, Kattiawar, the Deccan, Concan, Behar, the Carnatic, Central and Southern India, Nepaul and Darjeeling.

A permanent resident in Sind and most parts of India. In Sind it breeds in January, making a large nest of sticks lined with straw, leaves, &c., on high trees, laying normally 2 broad oval or spherical eggs; the ground colour is greyish white, either unspotted or with blotches and patches of yellowish brown.

In size the eggs vary from 2·35 to 3·25 × 1·8 to 2·25.

Gen. **Nisætus**.—*Hodgs.*

Bill much hooked at tip; cere large; nostrils large, elliptic; upper mandible festooned; tarsus feathered to the toes. No elongated occipital crest.

Nisætus fasciatus, *Vieill* (*Aquila apud Vieill*) *Mem. Lin. Soc. Paris*, p. 152; *Sharpe, Cat. Acc.* p. 250; *Strickl. Orn. Syn.* p. 61. Falco Bonelli, *Tem. pl. col.* i. pl. 288. Aquilla Bonelli, *Less. Man. Orn.* i. p. 83; *Gould. B. Eur.* i. p. 7; *Shelley, Birds of Egypt*, p. 206. Eutolmætus Bonelli, *Blyth, J. A. S. B.* xix. p. 174; *Hume, Rough Notes*, i. p. 189; Pseudætus Bonelli, *Bp. Cat. Ois. Eur. Parzud.* p. 1; *Hume, Stray Feathers*, i. p. 158. Nisætus Bonelli, *Jerd. B. of Ind.* i. p. 67, No. 33; *Murray, Hdbk., Zool., &c., Sind.*, p. 110.—The Crestless Hawk Eagle.

Adult Female.—Above deep brown, the feathers white at base, some of them paler margined; eyebrow and sides of neck streaked with white. Sides of the face white; cheeks streaked with brown, ear-coverts inclining to rufous. Under surface white with dark shaft-stripes; flanks irregularly barred and marked with dark brown arrow head

markings. Feathers of the tarsus more or less pale brown, varied with dark brown and irregularly spotted with white; under wing-coverts white, streaked with black, the lower ones entirely black with white tips; axillaries white, barred and streaked with blackish. Quills deep brown, mottled on the inner web with white. Tail ashy brown, inclining to grey, with 5—6 indistinct bars of brown near the base, and a broad subterminal band of dark brown; the tips of the feathers fulvous; cere and gape dingy yellow, bluish about the nostrils. Bill horn black. Feet whitish brown, tinged with yellow. Iris yellow.

Length.—26 inches, culmen 2·5, wing 21, tail 11·5, tarsus 4.

Adult Male.—*Length*, 27—29 inches, wing 18—19·6, tail 11, tarsus 3·5.—(*Sharpe, Cat. Acc.*)

Hab.—Found in Southern Europe and the Mediterranean. Breeds in Sind during December; also in the Punjab, where, as well as in the N. W. Provinces, Persia, Beloochistan, and Southern Afghanistan, it is not uncommon. It is also recorded from Kutch, Guzerat, the Deccan, Concans, Central and Southern India, the Carnatic, and in fact the entire Indian Peninsula.

Nisætus pennatus, (*Falco apud Gm.*) *Sys. Nat.* i. p. 272; *Tem. pl. col.* i. pl. 33; *Sharpe, Cat. Acc.* p. 253. Aquila pennata, *Vig. Zool. Journ.*; *Gray, Gen. B.* i. p. 14; *Jerdon, B. of Ind.* p. 63, No. 31; *Layard. B. S. Afr.* p. 10; *Murray, Hdbk., Zool., &c., Sind.* Hieratus pennatus, *Kaup. Mus. Senck.* iii. p. 260; *Blyth, J. A. S. B.* xv. p. 7; *Hume, Rough Notes* i. p. 182; *S. F.* vol. vii. pp. 74, 198; viii. 162 1 × ·307.—The Dwarf or Booted Eagle.

Head and neck, behind, and on the sides, rufous or pale orange brown, the feathers lanceolate and streaked mesially with dark brown; some of the lengthened feathers entirely dark brown and forming a not very apparent crest. A narrow superciliary stripe; a band from the angle of the mouth below the ear-coverts, and a central chin stripe dark brown. Ear-coverts rufescent brown; back, scapulars and wing-coverts, sepia brown; the median wing-coverts, and some of the scapulars broadly edged with fulvous white, forming a conspicuous wing band; rump and upper tail-coverts like the back, the latter shading from dull fawn brown to buffy white on their margins and tips. Tail dull sepia brown, shaded with ashy, tipped with fulvous white, and with 4—5 indistinct bars of darker brown, more distinct on the under surface. Primaries dark brown, inclining to ashy white basally on their inner webs; secondaries indistinctly barred with dull brownish white. Under surface of body rufous, buffy, or fulvous white, deeper on the breast, and streaked with dark brown, the streaks disappearing on the abdomen, thighs, and under tail-coverts, which are white. Under wing-coverts white with a few narrow shaft-streaks. Cere and gape bright wax yellow; bill bluish black, pale blue at the base; feet pale wax yellow; iris pale brown.

Length, Female.—19—24 inches, wing 15·5 to 16, tail 9 to 9·25, tarsus 2·8. The young bird is paler beneath, the breast rufous or fulvous with

a white shoulder spot, and white lores and forehead. The upper tail-coverts are whitish, and the tail distinctly barred on both webs.

Adult Male.—Smaller than the female; *length* 19 inches, wings 13·7, tarsus 2·4.

Hab.—Sind, the Punjab, N. W. Provinces, Oudh, Beloochistan (Quetta), Persia and Afghanistan; also the Concans, Deccan and throughout the Indian Peninsula and Ceylon. Hume says it breeds in Spain in April and May, and that Mr. Theobald found a nest in the Salem District at Huroor. The eggs were two in number; one which reached him, he says, was a very broad oval. Ground colour dead white, devoid of gloss, and thickly blotched and streaked throughout with reddish brown. Size 2·13 × 1·78 inches.

Gen. **Circaetus**.—*Vieill.*

Bill short, gradually curving from the base, much hooked at tip. Nostrils oval, oblique. Wing long, more than once and a half the length of the tail. 3rd quill longest. First three quills emarginate. Tarsi plumed below the heel. Toes scutellate at base of the claws.

Circaetus gallicus, *Gmel. Syst. Nat.* i. p. 295; *Vieill. Nat. Hist. Dict.* vii. p. 137; *Gray, Gen. Birds*, i. pl. 16; *Jerdon, B. Ind.* i. p. 76, No. 38; *Hume, Rough Notes*, i. p. 217; *Shelley, Birds of Egypt*, p. 202; *Sharpe, Cat. Acc.* p. 280; *Hume, Str. Feathers*, vii. 74, 199, 503; *Murray, Hdbk., Zool., &c., Sind*, p. 110.—The Common Serpent-Eagle.

Adult Male.—Above dark brown with a purplish gloss; the wing-coverts rather paler, especially on their margins; head rather more ashy brown; the forehead, lores, sides of face, and chin whitish with narrow hair-like lines of black, a streak of which overhangs the eyebrow. Cheeks, hinder ear-coverts and sides of the neck, brown. Under surface of body white; the throat narrowly streaked with brown, and with a distinct central dark shaft-stripe; chest white, streaked with brown; flanks barred brown, at wide intervals, the bars disappearing on the thighs and under tail-coverts, which are almost entirely white; under tail-coverts and axillaries white with irregular spots or bars of brown. Quills black; secondaries browner, the outer ones glossed with purplish and narrowly tipped with white. Inner lining of quills white, excepting the tips and inner margins of primaries, which are deep brown; secondaries barred with dark brown, the subterminal band broad. Some of the upper tail-coverts notched externally and tipped with white. Tail brown, tipped with white and crossed with three dark or blackish brown bars. Cere whitish, tinged bluish grey. Bill pale bluish grey at base, blackish horny at tip. Iris bright or orange yellow.

Length 26 inches, culmen 2·15, wing 19·65, tail 11·5, tarsus 3·7.

Adult Female.—Larger; *length* 31 inches, wing 21·3, tail 12·5, tarsus 4.

Hab.—Sind, Punjab, N. W. Provinces, Bengal, the Concans, Deccan, Kutch, Kattiawar, Behar, Nepaul, and Rajputana. Said to be found throughout the Indian Peninsula and all the countries bordering the

Mediterranean, extending into South Eastern Europe. Breeds in Upper India (Gurhwal, Etawah, *Hume*); also in Palestine, *Tristram*—during January, February, March, April and May on high trees. Hume (*Rough Notes*) says, that from between forty and fifty nests, taken by himself and friends, never more than a single egg was obtained from any one. The eggs are typically broad ovals, with a slightly pyriform tendency, of a bluish white colour and invariably spotless. Mr. Tristram, in his *Ornithology of Palestine* (Ibis, 1865), remarks that of the eggs he took at Carmel and Heshbon, east of the Dead Sea, one was prettily spotted and the others were white.

Gen. **Spilornis**, *Gray*. Hæmatornis, *Vigors*.

Bill straightened at the base; wings short; head crested, crest feathers rounded. Other characters as in *Circaetus*.

Spilornis cheela, *Lath. Ind. Orn.* i. p. 14; (*Falco apud Lath.*) *Bp. Consp.* i. p. 17; *Strickl. Orn. Syn.* p. 17; *Jerd. Birds of Ind.* i. p. 77, No. 39; *Hume, Rough Notes*, i. p. 222; *Hume, S. F.* i. p. 306; *Sharpe, Cat. Acc.* p. 287; *Murray, Hdbk., Zool., &c., Sind*, p. 110. Circaetus cheela, *Gray, Cat. Acc.* p. 18.—The Crested Serpent-Eagle.

Young.—Above brown, with large spots of dark brown near the end of each feather, which is slightly tipped with fulvous; the bases of the feathers white; the upper tail-coverts tipped and barred on the outer web with the same; wing-coverts blackish brown, the least ones apically margined with white; the greater series whity brown, more or less entirely white on inner web, mesially streaked with dark brown, widening into a spatulate apical spot. Quills dark brown, tipped with white, the secondaries more broadly barred across with blackish brown, very distinct underneath, where the inner webs are for the most part white. Tail ashy brown, tipped with white, and crossed with three broad bands of darker brown. Head and neck all round white, with a narrow shaft-stripe and a diamond shaped apical spot of dark brown. Ear-coverts and cheeks nearly uniform brown. Under surface of body white, with broad streaks of brown on the breast, becoming very narrow and linear on the flanks; thighs narrowly barred with brown. Under wing-coverts white, with large oval spots of rufous-brown on the innermost, and having bars of brown on the lower series.

Adult Female.—Head much crested, jet black, with conspicuous white bases to the feathers; those of the nape tipped with dull ochraceous; rest of upper surface of body purplish brown, paler on the inter-scapulary region; the wing-coverts blacker, with remains of white tips, which are less distinct on the scapulars, but very broad on the upper tail-coverts. Quills brown, tipped with white and mottled slightly on the outer web, but more on the inner with the same; all the quills dark brown at base and having a broad subterminal band of blackish brown, the primaries showing a second dark brown band near the base; the inner web of the quills below whitish, showing the bands very distinctly. Tail black, narrowly tipped with whitish and crossed with a very broad median band of pale whity brown; sides of face and chin

blackish with a distinct greyish band, the latter showing slight tips of fulvous to the feathers; rest of under surface pale ochraceous brown, with distinct but irregular transverse lines of dark brown; the rest of the under surface with large white spots rather oblong in shape, mostly margined above and below with black, changing to bars on the thighs and under tail-coverts. Under wing-coverts and axillaries light rufous with very distinct oval spots of white.

Length.—30 inches, culmen 2·25, wing 20·5, tail 13, tarsus 4·5.

Adult Male.—Smaller; *length* 28 inches, wing 18·5, tail 12, tarsus 4·15. Chest perfectly uniform brown with no traces of cross barrings on the under surface; breast and lower parts very largely and distinctly spotted with white; cere, loral skin and gape bright yellow; bill slaty, plumbeous at base, bluish black at tip and on culmen; feet pale dingy yellow; iris intense yellow. (*Sharpe*).

Hab.—Sind, in the Narra Districts, and in well-wooded situations; also the Concan, Himalayas, Nepaul, Assam and Burmah; not uncommon in the Punjab (Shaharunpur District). Breeds in Northern India. Eggs usually one in number, mottled and streaked with dingy brick-red and blood-red; ground colour white. Size 2·8 × 2·25 inches. Mr. Hume, in his *Rough Notes*, gives a good compiled account of the nidification of this species.

Pandion haliætus, *Lin. Syst. Nat.* i. p. 129; *Sharpe, Cat. Acc. B. M.* i. p. 450; *Less. Man. d'Ornithology*, i. p. 86; *Sw. and Rich. Faun. Bor. Am. Birds*, p. 20; *Gould. Birds of Eur.* pl. 12; *Bp. Consp.* i. 16; *Jerd. B. Ind.* i. p. 80, No. 40; *Hume, Rough Notes*, i. p. 234; *id. Stray Feathers*, i. p. 159; *Blanford, Eastn. Persia*, p. 114; *Murray, Hdbk., Zool., &c., Sind*, p. 110; *Shelley, B. Egypt*, p. 203. Pandion indicus, *Hodgs. in Gray's Zool. Misc.* p. 81. *Muchee-Mar*, Sind; *Much Murrung*, Hind.—The Osprey.

Head and nape white; the feathers of the forehead and crown with dark brown stripes; a dark brown streak from the eyes over the ears; upper plumage rich hair brown; quills blackish; tail pale brown with dark bars, whitish on the inner web, beneath pure white with some brown spots on the breast, longitudinal in youth, broader in advancing age, and tending to coalesce in the fully adult; irides bright yellow; legs and feet plumbeous yellow.

Length.—Of a female 26 inches, wing 20, tail 9, tarsus 2·4; bill black.

Hab.—Sind, Beloochistan, and Persia; also the Punjab, N. W. Provinces, Bengal, Kutch, Kattiawar, Concan and Deccan, and nearly throughout the Indian Peninsula in suitable localities. Occurs also all over Europe and Africa, N. and S. America, China and Japan. Very widely distributed. Most abundant along the coasts, large rivers and lakes. In Sind it is a winter visitant.

Mr. Sharpe (*Cat. Acc.* p. 450) remarks that "Ospreys seem to get whiter on the head with age. The mottling on the breast is strongly marked in all old birds, and that the tail becomes more uniform brown with age, so that a strongly barred tail is a sure sign of immaturity."

Haliætus, *Savigny*.—Bill straight at the base, longish, compressed, curved towards the tip, which is much hooked; margin of upper mandible sinuate; wings long; 4th and 5th quills sub-equal, longest; tarsus plumed for nearly half its length; lower half of tarsus scutellate.

Haliætus leucoryphus, *Pallas. Reis. Russ. Reichs.* i. p. 454; *Keys. and Blas. Wirb. Eur.* p. xxx.; *Strick. Orn. Syn.* p. 52; *Hume, Rough Notes*, ii. p. 242; *Stray Feathers*, i. pp. 102-159; *Hume and Henderson, Lahore to Yarkand*, p. 173; *Blanford, Eastern Persia*, p. 112; *Sharpe, Cat. Acc. B. M.* p. 309; *Murray, Hdbk., Zool., &c., Sind*, p. 111. H. fulviventer, *Jerd. B. Ind.* i. p. 82, No. 42. Ichthyætus leucoryphus, *Blyth. Ann. and M. N. H.* xv. p. 37. Cuncuma macei, *Gray, Cat. Acc.* p. 23.— The Ring-tailed Sea Eagle.

Adult Male.—Above dark brown, with a slight purplish gloss; some of the greater coverts slightly margined with paler brown; quills blackish; the secondaries rather browner like the scapulars; the lower surface of the quills brown, inclining to bluish ash colour on the inner web of the primaries; some of the secondaries mottled with white near the base of the inner web; lower back, rump, and upper tail-coverts purplish brown, some of the outermost of the latter whitish at base; tail white, blackish at base, with a broad black terminal band. Head, hind neck and interscapulary region sandy-brown; the feathers of the head and hind neck streaked with fulvous. Sides of face and throat buffy white, the latter with narrow whitish streaks down the centre of the feathers; rest of under surface of body dull fulvous brown, lighter on the chest, where the feathers are paler-centred, and deeper brown on the flanks, thighs and under tail-coverts. Under wing-coverts and axillaries blackish brown, slightly mottled with white. Cere pale bluish green. Nostrils, gape, and base of lower mandible bluish. Upper mandible greenish horn colour, dusky at tip; feet greyish white; iris pale brownish yellow.

Length.—30 inches, culmen 2·6, wing 22·2, tail 12·2, tarsus 3·6.

Adult Female.—Length, 33 inches, wing 24·4, tail 11·7, tarsus 4·3.

Young.—Above dark brown, the feathers of the back deeper towards their bases; the wing-coverts lighter than the back, and the upper tail-coverts plainly margined with whity-brown; greater coverts dark brown with whity-brown tips; quills blackish, externally shaded with ashy; the innermost secondaries dark brown like the back; lower surface of quills ashy brown, some of the innermost primaries inclining to whitish on inner web; tail dark brown, shaded with ashy above and below; head, neck, and under parts fulvous brown, deeper on the head and varied with white bases to the abdominal plumes and under tail-coverts; the head and neck rather darker than the under parts and streaked with sandy brown; the chest and breast feathers with broad whity-brown margins and tips; under wing-coverts dull brown, margined with paler brown; the median series streaked with whity-brown, the greater ones ashy white at the base and mottled along the shaft towards the tip, which is also white; feet clear lemon yellow. (*Sharpe*).

Mr. Hume (*R. N.* p. 245) describes a nestling female nearly able to fly as a nearly uniform dark brown above and lighter below; the legs and feet a clear pale lemon yellow.

Hab.—Sind, Punjab, N. W. Provinces, Oudh and Bengal; Kutch, Rajputana, the Western Coast and the Concan; also Beloochistan, Persia and Afghanistan. Ascends the Ganges and other large rivers; found also in Nepaul and Cashmere. In the Concan and along the Sind, Kutch and Kattiawar Coasts, it is known as the *Mutchee Mar* or *Mutchlee Mung*.

The Ring-tailed Sea Eagle is found throughout the year in Sind, along the Indus, and on the larger lakes. It breeds in the winter months, (November, December and January), building a nest of twigs, &c., from 4 to 5 feet in diameter, inclusive of the outer thin layer, usually on high trees in the vicinity of water. Eggs usually 2, but I have found a third and a fourth laid by the same bird a fortnight after taking the two first ones. In colour they are white or greyish white and unspotted, and measure $2\frac{3}{4}$—3 inches × $2\frac{1}{4}$ to $2\frac{1}{2}$.

Haliætus albicillus, *Linn. Syst. Nat.* i. p. 123; *Sharpe, Cat. Acc.* p. 302. H. albicilla, *Leach. Syst. Cat. Mam. &c., B. M.* p. 9; *Gould. Birds Eur.* p. 10; *McGillivray, Brit. B.* iii. p. 221; *Shelley, Birds of Egypt*, p. 204; *Hume, S. Feathers*, i. p. 159; *id. RoughNotes*, p. 257; *S. Feathers*, vii. 341, 467; *Murray, Hdbk., Zool., &c., Sind*, p. 111. Falco albicilla, *Gm. Syst. Nat.* i. p. 253. Aquila albicilla, *Pall. Zoogr. Rosso. As.* i. p. 345. Haliætus pelagicus, *Hume, Rough Notes*, ii. p. 252. Haliætus Brooksi, *Hume, Ibis*, 1870, p. 438.—The European White-tailed Sea Eagle.

Male.—The legs and feet bright orange yellow. Gape and portion of cere yellow, upper portion being yellowish brown. Bill blackish horny; head, nape, cheeks, ear-coverts and sides of the neck, hair brown; all the feathers white at their bases, in some for the basal half, in others for fully the basal two-thirds, but very little of the white showing through, the feathers being densely set; all the feathers of these parts long and linear, those of the occiput especially; the back of the neck, the whole of the back and rump, scapulars and wing-coverts, except the greater primary coverts, as well as the feathers of the breast and abdomen a warm buffy fawn colour, changing to white at their bases, and more or less broadly tipped with hair brown; the longer scapulars and the upper tail-coverts, which latter are very broad and come down to within some four inches of the tip of the tail, a mixture of yellowish and hair brown, mottled and freckled with white and yellowish white; tail, which is very wedge-shaped, dark brown, mottled all over with dingy yellowish white, which colour predominates on the inner webs; the quills, winglet, and greater primary coverts chocolate brown; the second to the 5th primaries conspicuously emarginate on the outer web, and with a grey silvery tinge above the emarginations; the 1st to the 5th primaries conspicuously notched on the inner webs; the chin and throat pale buffy brown, the feathers whitish at the base and darker at the tips; the flanks and thigh-

coverts pale yellowish brown, the feathers tipped darker; the lower tail-coverts dingy white, broadly tipped with brown, which in the longer ones is a dark hair-brown; in the shorter a dull yellowish brown; wing-lining a sort of umber brown, the bases of all the feathers paler, some of them fawn coloured and some white.

Female.—The legs, feet, cere and gape a sort of brownish yellow; the upper mandible and claws blackish horny; the tip of the lower mandible yellowish horny; the whole of the head, nape, sides of the neck, cheeks, chin and throat pale yellowish brown; the feathers white, tipped with yellowish brown, which, owing to the feathers being closely set, is the predominant colour, especially on the top of the head; the ear-coverts a darker brown; the whole of the back of the neck, back, rump and upper tail-coverts, breast, sides, abdomen, vent, and lower tail-coverts white, comparatively narrowly tipped with yellowish brown, and many of the feathers, with a narrow, linear, ovate, hair-brown shaft-spot near the tip. As in the male, the upper tail-coverts are ovate-lanceolate, very broad and long, and reach to within less than six inches of the end of the long wedge-shaped tail; most of the scapulars and the tail feathers are a mixture of dull dark and pale dingy yellowish brown, everywhere mottled and freckled with dirty white, which occupies almost the whole of the inner webs of the lateral tail feathers; the wing-coverts, except the greater primary coverts, are wood brown, showing little or nothing of the white bases; most of the tertiaries are mottled white and dingy yellowish brown, like the tail; the secondaries are a dull, slightly rufous brown, much mottled on the interior webs with white, and the primaries are dark chocolate brown, greyish above the emarginations; some of the primary greater coverts are dark chocolate brown and others are a pale rufous brown. (*Str. F.* vii. 341).

The following is McGillivray's description, quoted in *Stray Feathers*:—

Male.—The cere and bill are pale yellow; the iris bright yellow; the tarsi and toes gamboge; the claws black with a tinge of greyish blue; the plumage of the head, neck, forepart of the back and breast with the upper wing-coverts, greyish yellow; the feathers all greyish brown at the base; of the other parts greyish brown, edged with yellowish grey; scapulars and feathers of the rump glossed with purple; those of the abdomen, tibia and subcaudal region inclining to chocolate brown; the quills and alular feathers brownish black, with a tinge of grey; the inner secondaries inclining to chocolate brown; the shafts of all white towards the base; the lower surface of the quills, and the large coverts tinged with greyish blue; the upper tail-coverts and the tail are white (generally freckled with dusky grey at the base); the down on the breast pale grey, that on the sides darker.

Length, to end of tail 36 inches, extent of wing 72 inches, bill along the ridge 3·41, along the edge of lower mandible 3, its height 1·41, wing from flexure 24 inches, tail 11·4, tarsus 4.

The female does not differ from the male in colour, and her superiority in size is often not very remarkable. *Length*, to end of tail 40

inches, extent of wing 80, bill along the ridge 3·91, along the edge of lower mandible 3·33, its height 1·66, wing from flexure 27·5, tail 12 inches, tarsus 4·5 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Beloochistan Coast, and Persia. On the Indus and the larger lakes or dhunds throughout Sind, especially on the Munchur Lake, it is very common, also on the Jhelum, Chenab and Sutlej rivers. Sharpe gives its habitat as Greenland, Iceland, Faroe Islands, the whole of Europe and Northern Asia, Kamschatka and Japan, extending into China as far as Amoy.

Sub-Family, BUTEONINÆ.

Bill small, moderate, tip hooked. Wings moderate; tail generally short; tarsi with scutæ in front and behind; tibia longer than tarsus. Outer toe connected to middle toe by interdigital membrane.

Gen. **Buteo**.—*Cuv.*

Bill short with hooked tip; margin of upper mandible slightly festooned; nostrils oval. Lores clothed with bristle-like feathers. Wings long; 3rd, 4th and 5th quills subequal, and longest; inner webs of 1st four quills strongly notched. Tarsus bare or feathered on the upper third only.

Buteo ferox, *S. G. Gmelin, N. Comm. Ac. Petrop.* xv. p. 442; *Hume, Rough Notes*, ii. p. 274; *Stray Feathers*, iv. p. 362 (1873); *Sharpe, Cat. Acc.* p. 176. Buteo canescens, *Hodgs. Beng. Sport. Mag.* 1836, p. 180; *Jerd. B. of Ind.* p. 88, No. 45. Buteo longipes, *Jerd. Madr. Journ.* x. p. 75. B. aquilinus, *Jerd. B. of Ind.* i. p. 90.—THE LONG-LEGGED BUZZARD.

The plumage of this large and handsome Buzzard varies considerably in all its different stages. This circumstance has led to its being described as *canescens*, Hodgs.; *longipes*, Jerdon; *rufinus*, Rupp.; *leucurus*, Naum.; *fuliginosus*, Hume. Mr. Hume in his scrap book goes very minutely into the differences observed in the plumage of its various stages, and states at page 281, that "the great difficulty we meet with in assigning any chronological value to these changes is that the changes on the upper surface do not correspond with those on the lower. It is easy enough, he says, to arrange any number of specimens, in what, looking at the upper or under surface only, appears a very perfect series in which no links are wanting, but directly we turn the specimens over, all traces of any arrangement seem to vanish." The question as to which is the adult plumage seems yet a vexed one, the Buzzard being known to breed in plumage which has been described as immature, but it is probable that the fuliginous plumage (*B. fuliginosus*) of Hume is that of very old birds, in which the whole head, neck, ear-coverts, cheeks, throat and breast is a deep umber brown, indistinctly margined with rufous.

Male.—Feathers of the forehead and crown of the head rufescent brown with stiff dark shafts. A narrow dark line in front of the superciliary

edge of the eye. Lores whitish, with numerous elongated stiff bristle-like feathers, which extend to the base of the cere, partially cover the nostrils and turn up on to the front of the forehead above the base of the cere. Cheeks rufescent brown, the feathers dark shafted. Ear-coverts yellowish or a soiled white, the feathers dark shafted. Chin and throat white, some of the feathers with dark shafts. All round the edges of the lower mandible there are stiff bristle-like hairs, which are ½ an inch or more long. A rufous brown line behind the eye, and another from the gape forming a fairly distinct moustachial stripe. Sides of the neck rufous, the feathers dark shafted and edged lighter. Breast rufescent, the feathers dark shafted and edged buffy. Nape and back of the neck rufous brown, mottled with white, the basal portion of the feathers showing through. Abdomen deep chestnut brown, the feathers edged fulvous and with dark shafts. Thigh-coverts deep brown, the feathers edged reddish fulvous; upper back, scapulars and lesser wing-coverts brown, edged with rufous. Lower back and rump uniform brown, the lateral feathers of the upper tail-coverts bright rufous and irregularly barred with brown. Lower tail-coverts white. Tail (except the two lateral feathers, which are shaded with ashy grey), pale rufous, with a broad terminal band of slightly deeper rufous; the shafts and inner webs white, with traces of brown cross bars. Outer webs of quills ashy grey, the inner webs blackish from the tip to the emargination or sinuosity, and white beyond, forming on the under surface of the wing a large white patch. Except the first three, all the other primaries are barred on both webs; the 3rd, 4th, and 5th quills emarginate on the outer webs, and all five primaries emarginate on their inner webs.

Legs and feet pale lemon yellow. Irides brownish yellow; orbital ridge dusky greenish. Bill brownish plumbeous, gape yellow, tip black. Cere yellowish green.

Length.—24 inches, wing 16·75, tail from vent 9·75, tarsus 3·20.

Female obtained at Sehwan, 5th February, similar to the male; *length* 25 inches, wing 19·75, tail from vent 10·75, tarsus 3·75.

Hab.—Winter visitant in Sind. Found throughout India. It is recorded from Northern, Southern and Central India, N. W. Provinces, the Punjab, the Gangetic Valley, N. W. Himalayas, Kashmir, Nepaul, Oudh and Behar; also from Beloochistan, Persia, Afghanistan, Eastern Turkistan and Palestine. In Palestine Mr. Tristram (Ibis, 1865) took its eggs from a rocky ledge on Mount Carmel. The plumage of his Palestine specimen, he says, is very rufous, and he shot breeding birds with and without the bar on the tail.

Gen. **Butastur**, *Hodgs. J. A. S. B.* xii. p. 311.

Bill short. Edge of mandible scarcely festooned; nostrils small, oval, with a superior membrane. Wings reaching nearly to end of tail; 3rd and 4th quills subequal and longest; the first four emarginate.

Butastur teesa, *Hodgs. J. A. S. B.* xii. p. 311 (1843); *Sharpe, Cat. Acc.* p. 295. Poliornis teesa, *Kaup. Classif. Saug. u. vog.* p. 122;

Gray, Gen. Bird, i. p. 30 ; *Jerd. B. of Ind.* i. p. 92; *Hume, Rough Notes*, ii. p. 286 ; *id. Stray Feathers*, p. 159; *Murray, Hdbk., Zool., &c, Sind*, p. 115 (1873).—THE ZUGGUN FALCON or WHITE-EYED BUZZARD.

Adult Male.—Above umber or pale rufous brown, the feathers margined paler, and with dark shaft-stripes. Forehead and a nuchal mark white. Ear-coverts light brown, the feathers very lax. Lores white, with elongate stiff hair-like feathers, the edges of the under mandible also with stiff bristles. Rump and upper tail-coverts rufous brown, the rump with dark shaft-stripes, and the upper tail-coverts with dark cross bars. Tail pale rufous, tipped with buffy white and crossed with 6—7 indistinct bars, the subterminal one black and broadest; wing-coverts like the back, the median series mottled light brown and whitish. Primary coverts dark brown, externally shaded greyish. Outer webs of primaries dark brown, frosted over with ashy grey, and broadly tipped with darker brown. Inner web pale brown between the black tip and emargination of the first four quills, and white beyond, with a few faint dark incomplete bars. The secondaries pale brown, half the inner webs, with 4—5 bars of dark brown and tipped darker; outer web of the secondaries pale brown with a rufous tinge, tipped blackish, and with faint traces of transverse bars.

Chin and throat white or yellowish white, bordered on each side with a black moustachial stripe from the base of the lower mandible, and one of the same colour down the centre of the chin and throat. Breast pale rufous brown, with yellowish white or fulvous spots, the feathers dark shafted. Rest of under surface buffy white, barred with rufescent brown. Under wing-coverts white, some of the feathers streaked and spotted with rufous brown. Thigh-coverts pale fulvous or buffy white, most of the feathers with a subterminal triangular patch of rufous brown. Vent and lower tail-coverts white, some of the feathers with a subterminal band or triangular patch of rufous brown; under surface of tail feathers greyish white, the transverse band showing through in all but the exterior feather.

Legs and feet dingy orange yellow. Iris pale yellowish white. Eyelid orange yellow.

Length.—16·75 to 18·5 inches, culmen 1·4, wing 11 to 12·5, tail 6·65 to 7·8, tarsus 2 to 2·15.

Hab.—Sind, Beloochistan, Persia; Punjab, N. W. Provinces, Oudh, Bengal, Nepaul; Behar, Kattiawar, Deccan, Concans, Cutch, Rajputana, and N. Guzerat.

Gen. **Circus**.—*Lacep.*

Upper mandible slightly festooned; lower emarginate. Nostrils round, with no bony excrescence. Tarsi long and slender, naked; wings long; the first quill not so long as the fifth, the third or fourth longest; cere large, surrounded with a ruff of setaceous curved plumes.

Circus macrurus, *S. G. Gmel. N. Comm. Petrop.* xv. p. 439. Circus Swainsonii, *Smith, S. Afr. Q. Journ.* i. p. 384; *Gray, Gen. B.*

i. p. 32; *Jerd. Birds of Ind.* p. 96, No. 51; *Hume, Rough Notes,* ii. p. 298; *Sharpe, Cat. Acc. B. M.* p. 67; *Murray, Hdbk., Zool., &c., Sind.* p. 115; Circus pallidus, *Sykes, P. Z. S.* 1832, p. 80; *Shelley, B. Egypt,* p. 183; *Hume, S. F.* i. p. 160.—THE PALE HARRIER.

Adult Male.—Above pale bluish grey, scapulars slightly darker; eyebrow and sides of face white; under surface of body greyish white. Quills blackish brown; the secondaries ashy grey, tipped with white, and the primaries washed with ashy grey and white at base of inner web; other quills white underneath. Upper tail-coverts white, banded with ashy grey. Tail feathers—except the two middle ones, which are uniform ashy grey—banded grey and white; the tips and under surface of all the feathers white. Bill black; feet and irides yellow.

Length.—17·5 to 18·5 inches, culmen 1·15, wing 13·5 to 14, tail 8·8 to 9·5, tarsus 2·75.

Adult Female.—Above brown, the feathers of the head and hind neck streaked, and of the upper surface and lesser wing-coverts margined and tipped with rufous. Forehead, supercilium, and a spot below the eye white. Cheeks and ear-coverts dark brown, slightly streaked with tawny. Quills dusky brown, the primaries externally shaded with ashy grey, and like the secondaries obsoletely barred darker and tipped with buffy white; upper tail-coverts white, banded or spotted with dark brown. Tail with the two centre feathers ashy brown and with six blackish brown bands, the rest with four bands, those on the outer feathers being pale rufous. Under tail-coverts rufescent. Under wing-coverts buffy white, spotted and streaked with brown. Cere greenish yellow; feet yellow; irides brownish.

Length.—20·5 to 21 inches, wing 14 to 14·5, tail 10 to 10·5, tarsus 2·8 to 3.

Hab.—Europe, Africa, and throughout India, Ceylon, China, and Burmah. Has been noted from the N. W. and Central Provinces, Punjab, Sind, Beloochistan, Afghanistan, Persia, S. India, Kutch, the Concans and Deccan, Kattiawar, Behar, Nepaul. In India it is a winter visitant, arriving about the middle of September and leaving again in March.

Circus cineraceus, *Mont. Trans. Linn. Soc.* ix. p. 188; *Gould. B. Eur.* i. pl. 35; *Jerd. Birds Ind.* i. p. 97, No. 52; *Hume, Rough Notes,* ii. p. 303; *Shelley, B. Egypt,* p. 184; *Murray, Hdbk., Zool., &c., Sind,* p. 115. Circus pygargus, *Linn. S. N.* i. p. 148; *Sharpe, Cat. Acc. B. M.* p. 64.—MONTAGUE'S HARRIER.

Adult Male.—Above blue grey; throat, breast and wing-coverts darker, the latter slightly mottled, and with a terminal spot of a dark ash colour. Primary coverts and secondaries silvery grey, tipped with white, and with two bands of black, one of which is hidden by the greater wing-coverts. Primaries black, the inner ones greyish at the tips and on the inner web. Secondaries grey with a black band. Tail grey or greyish white, the two outer feathers banded on their inner webs with rufous, the others dusky, with fine ashy black bands. Upper

tail-coverts white, shading into ashy grey. Lores whitish. Abdomen, flanks, thighs and under wing-coverts white, streaked with fawn; the axillaries also with spots of the same colour. Cere greenish yellow. Feet and irides yellow.

Length.—18 inches, wing 14 to 15, tail 9·5, tarsus 2·3.

The adult female differs from the male in being nearly uniform brown with scarcely any fulvous margins to the feathers. The hind head and neck are streaked with fulvous, as also the sides of the neck and facial ruff. Feathers under the eye whitish. Upper tail-coverts white; tail brown tipped with paler brown and banded with five bars of darker brown. Under surface of body buffy white, the feathers with rufous centres; legs yellow; irides hazel.

Length.—19 to 19·5 inches, wing 15·3, tail 8·7, tarsus 1·4.

Hab.—The same as the last. In India it has been found in Madras, Central and N. W. Provinces, the Punjab, Sind, Kutch, Kattiawar, Concans and Deccan, Behar and Nepaul; also in Ceylon and Burmah.

It is like the last a winter visitant to India generally.

Circus æruginosus, *Linn. S. N.* i. p. 130; *Savigny, Syst. Ois. Egypt,* p. 90; *Hume, Rough Notes,* p. 314; *Shelley, Birds Egypt,* p. 181; *Jerd. Birds of Ind.* p. 99, No. 54; *Sharpe, Cat. Acc. B. M.* p. 69; *Murray, Hdbk., Zool., &c., Sind,* p. 116; *Hume, S. F.* i. p. 100.—The Marsh Harrier.

Adult Male.—Above dark brown, the feathers of the upper surface edged with rufous; the smaller wing-coverts buffy and centred brown; primaries, coverts and secondaries bluish ashy, tipped very slightly with pale white. Primaries blackish brown, paler at the tips, whitish at base of inner web. Upper tail-coverts greyish white and tinged with rufous. Tail bluish ash, slightly fulvescent beneath. Head, neck and breast pale rufous or creamy buff, with dark brown streaks; under parts reddish brown, or pale rufous, as also are the thigh-coverts; under wing-coverts buffy white, the axillaries with brown shaft-stripes. Cere greenish yellow; legs and irides yellow; claws black.

Length.—19 to 21·5 inches, wing 16, tail 9 to 10, tarsus 3·25.

Adult Female.—Larger; *length* 23 inches, wing 17, tail 10, tarsus 3·4.

The young bird is uniform reddish brown, the head, neck and cheeks in some stages being yellowish, rufous white, or white with brown stripes on the crown; upper tail-coverts rufous brown.

Hab.—Europe generally, China, Japan, N. E. and S. Africa, and throughout India, Burmah and Ceylon. In Sind and the Punjab it occurs in great numbers, frequenting the maritime districts, rivers, marshes, lakes and inundated fields, feeding on rats, mice, frogs, fish, &c. It occurs also in Kutch, Kattiawar, Jodhpore, North Guzerat, Central and Southern India, the Deccan and Concans, Beloochistan, Afghanistan, Eastern Turkistan, Gilgit, Nepaul, Malacca, and Upper Pegu.

Sub-Family, MILVINÆ,—Kites.

Nostrils oblique, oval; tarsi short. Bill small and slender, occasionally stout, curved from the base and much hooked at the tip; wings long; tail short, even, or long and forked.

Gen. **Haliastur**.—*Selby.*

Bill stout, curved and hooked. Nostrils circular with bony margin all round. Wings very long, the 4th quill longest; tail slightly rounded; tarsi plumed at the knee, and covered with scutæ.

Haliastur Indus, *Bodd. Tabl. pl. Enl.* 25; *Gray, Gen. Birds*, i. p. 18; *Jerdon, B. of Ind.* i. p. 101, No. 55; *Hume, Rough Notes*, ii. p. 316; *S. F.* vii. 251, i. p. 160; *Murray, Hdbk., Zool., &c., Sind* p. 116; *Gray, Cat. Acc. B. M.* p. 313. Haliætus Indus, *Sch. Mus. P.B.* p. 19.—The Maroon-backed Kite.

Adult.—Head, neck, throat, entire breast, and as far as the middle of the abdomen white, with dark brown shaft-stripes; rest of the plumage maroon, or rufous chestnut, paler on the secondaries, the tail paling into a fulvous white at the tip. Quills black, rufescent at base of inner web; under wing-coverts deep maroon, with dark shaft-stripes; cere brownish; feet greenish yellow; irides brown.

Length.—20 to 21 inches, wing 14·75 to 16, tail 7 to 8.

The young bird is a rather deep brown above, the feathers tipped with rufous. Head, neck, and lower parts pale rufous, streaked paler.

Hab.—India and Ceylon. Resident in Sind, breeding in March and April. Occurs also in the Punjab, N. W. Provinces, Kutch, Kattiawar, Ajmere, Concan, Deccan, Travancore, Upper Pegu, Nepaul.

Gen. **Milvus**.—*Cuv.*

Bill short, straight at the base, well curved and hooked at tip. Upper mandible with a rounded festoon. Nostrils oval, oblique. Wings long. Tail forked or emarginate. Tarsi short, plumed at the knees, and with scutæ in front below.

Milvus govinda, *Sykes, P. Z. S.* 1832, p. 81; *Jerd. B. of Ind.* p. 104, *No* 56; *Hume, Rough Notes*, ii. p. 320; *Sharpe, Cat. Acc. B. M.* p. 325; *Stray Feathers*, i. p. 160; *Murray, Hdbk., Zool., &c., Sind*, p. 116.

Adult Male.—Above brown or rufous brown, the head and neck rufescent with dark central stripes. Scapulars and wing-coverts edged with buff, the wing-coverts with dark central stripes. Quills and greater coverts dark brown, the quills albescent near the base and mottled with brown. Tail ashy brown, tipped with buffy white and barred with brown; the under surface pale brown or whitish, and also mottled and barred. Throat albescent with brown shaft-stripes. Under parts dull rufous brown, buffy on the vent and under tail-coverts, and with brown shaft-stripes. The feathers of the breast somewhat fulvescent. Under wing-coverts rufous brown, with dark brown centres to the feathers. Cere and gape yellow. Bill horny black. Feet yellowish. Irides yellowish.

Length.—20 to 23 inches; wing 18·5 to 19, tail 13, tarsus 2·25.

Hab.—Throughout India. A resident scavenger. Breeds in Sind on house tops, old mosques, and flat-roofed buildings,—seldom on trees,—during January, February, and March. It occurs also in Beloochistan, Afghanistan, and Nepaul.

Milvus melanotis, *Tem. et Schleg. Faun. Jap.*; *Blanford, J. A. S. B.* 1872, p. 153; *Gray, Gen. Birds*, i. p. 24; *S. F.* i. p. 160, iii. 229; *Sharpe, Cat. Acc. Br. Mus.* p. 324; *Murray, Zool., &c., Sind*, p. 116. Milvus major, *Hume, Rough Notes*, ii. p. 326.—The Large Pariah Kite.

Adult Male.—Above dark chocolate brown, all the feathers distinctly streaked down the centre with black; the wing-coverts a little paler brown; the lesser series washed with rufous, all with distinct black shaft-stripes. Greater coverts and quills dark brown, the secondaries paler brown, the primaries blackish, all the quills distinctly white at the base of the inner web, and sometimes mottled with brown. Tail rather pale brown, the centre feathers with a slight rufous tinge and distinctly barred with darker brown; these bars are distinct on the inner web only of the other feathers. Under surface of tail brownish ashy, the bars more or less distinct. Lores, forehead, cheeks and throat white, with distinct shaft-lines of dark brown; ear-coverts dark brown; throat white tinged with rufous on the lower part. Breast deep rufous brown, shading into clear rufous on the abdomen and under tail-coverts; the feathers on the breast margined lighter with broad central dark streaks. Under wing-coverts dark brown, dashed with rufous; the lower ones ashy brown, notched or barred with white on their inner webs. Cere pale greenish yellow. Bill horn black. Feet dull yellow. Irides reddish brown.

Length.—25·5 inches, wing 21, tail 13·2, tarsus 2·5.

There is yet a set controversy in regard to the distinctness of this species from *M. govinda*. Mr. Edwin Brooks, in vol. iv. *S. F.*, says that from an examination of the type of *M. govinda*, in the South Kensington Museum, he concludes that *M. melanotis* (T. and S.) and *M. major* (Hume) must be considered as synonyms of *M. govinda* (Sykes). Schlegel again unites *melanotis* and *govinda*, but Mr. Hume holds that the pure white wing patch of *major* distinguishes it equally from *melanotis*, *govinda* and *affinis*, a third species found in India, also by its larger size.

The following comparative measurements are given by Mr. Hume:—

	Wing, Male.	Wing, Female.
M. govinda.....	17·5 to 18	18 to 19·5
M. major	19 to 20·5.....	19·45 to 21
M. affinis	16 to 17·5.....	17 to 17·75

Hab.—Throughout India, Japan, and China; also Nepaul and Eastern Turkistan.

Gen. **Elanus**.—*Savigny*.

Bill small, ridge (without cere) greater than half of middle toe, without claw; tip much hooked and lengthened; edge of upper

mandible slightly sinuate. Cere small; nostrils oval. Loreal space feathered. Wings reaching to end of tail, pointed; 2nd quill longest; the 1st emarginate near the tip. Tail short. Tarsi short, plumed above, covered with small round scales. Middle claw keeled.

Elanus cæruleus, *Desf. Mem. Acad. R. des Science*, p. 503, pl. 15. Falco melanopterus, *Daud. Traite*, ii. i. p. 152; *Bree, Birds Eur.* i. p. 108. Elanus melanopterus, *Leach, Zool. Misc.* p. 5; *Jerd. Birds of Ind.* i. p. 112, No. 59; *Sharpe, P. Z. S.* 1869, p. 570; *Hume, Rough Notes*, ii. p. 21; *Str. F.* i. pp. 21, 163; *Murray, Zool., &c., Sind.* p. 117.—THE BLACK-WINGED KITE.

Adult.—Entire upper parts ashy grey, lighter on the head; forehead, eyebrow, lores and sides of face white; ear-coverts ashy grey; supercilium dark brown or black; lesser and median wing-coverts and winglet glossy black; greater coverts concolourous with the back. Axillaries and under wing-coverts white; inner lining of wing dark grey; primary coverts and quills ashy grey, the latter white at the base and black-shafted. Tail ashy, the two centre feathers greyish; entire under parts white. Cere, orbits, and feet yellow; bill black; irides crimson.

Length.—13 inches, wing 10·6 to 11, tail 5·6, tarsus 1·4.

Hab.—South Eastern Europe, Africa, India and Ceylon. Very widely distributed. Recorded from Egypt, Gambia, Transvaal, South Africa, and the Mediterranean; also from Kutch, Kattiawar, Jodhpore, Sambhur, North Guzerat, the Concan and Deccan, Pegu, Burmah and Nepaul.

It is a resident in Sind, and affects chiefly the acacia forests lining the banks of the Indus. Breeds in the Narra districts from June to August.

SUB-ORDER,—STRIGES.

Outer toes reversible; eyes encircled by a facial disk; nostrils generally covered wholly or in part, by stiff bristles.

Family, BUBONIDÆ.

Forehead furnished with two long tufts; ear orifice small. Tarsi stout, generally plumed. Middle toe longer than the inner one.

Sub-Family, BUBONINÆ,—EAGLE AND SCOPS OWLS.

Ear conch without an operculum.

Gen. **Ketupa**.—*Lesson.*

Bill large, strong, straight at base, moderately compressed and hooked. Wings not reaching to end of tail; 4th quill longest; tarsi naked, reticulate.

Ketupa ceylonensis, *Gmel. Sys. Nat.* i. p. 287; *Gray, Gen. Birds*, i. p. 38; *Jerd. Birds of Ind.* i. p. 133, No. 72; *Hume, Rough Notes*, ii. p. 379; *Str. F.* i. p. 431, ii. p. 469; *Sharpe, Cat. Striges*, p. 4; *Murray, Hdbk., Zool., &c., Sind*, p. 119.—THE BROWN FISH-OWL.

Adult.—Above fawn-brown, the feathers broadly centred black and mottled brown and fulvous on both webs. Feathers of the hind neck thinly barred with brown; the ear tufts with dark central streaks longitudinally. Quills dark brown, the primaries tipped and spotted on the outer web with creamy buff; the same spots on the inner webs, being dull fawn-brown; secondaries dark brown, with less distinct spots and bars, and more mottled with brown. Tail brown with a fulvous tip, and 3 or 4 pale fulvous bands. Chin and throat white streaked with dark brown. Loreal plumes whitish; under surface of body fulvous-fawn or vinaceous-rusty, all the feathers mesially streaked with broad black centres and with wavy bars. Disk rusty with dark brown stripes. Cere greenish grey. Bill pale horny yellow. Legs and feet dusky yellow. Irides bright yellow.

Length.—21 to 24 inches, wing 16·25, tail 8, tarsus 2·65.

Hab.—India, Ceylon, Assam and Tenasserim. I have had it at Khandalla and Poona in the Deccan. At Madras it is not uncommon, as also in Nepaul and Behar. In Sind it affects the forests, and breeds there in holes of decayed trees during December.

Gen. **Bubo**.—*Auct.*

Nostrils oval, situated in the anterior margin of the cere; ear tufts large; 3rd quill longest; tarsi never naked; toes feathered.

Bubo bengalensis, *Frankl. P. Z. S.* 1831, p. 115; *Gray, Gen. Birds*, i. p. 37; *Hume, Str. F.* i. p. 163, *Sharpe, Cat. Striges*, p. 25. Urrua bengalensis, *Jerd. B. of Ind.* i. p. 128, No. 69; *Murray, Hdbk., Zool., &c., Sind*, p. 118. Ascalaphia bengalensis, *Blyth, Ibis.* 1866, p. 252; *Hume, Rough Notes*, ii. p. 366.—The Rock-horned Owl.

Adult.—Forehead and crown dark brown, nearly black, the feathers narrowly margined with light fulvous; back of neck, light yellowish buff, the feathers mesially streaked with dark brown. Ear-tufts black, narrowly edged with fulvous; back and scapulars deep brown, mottled and barred with light yellowish buff; the outer scapulars whitish on their external web, forming a conspicuous shoulder-patch. Primaries rich tawny buff, barred across and tipped with brown; their coverts dark brown at tip, and with slightly vermiculated fulvous bars; secondaries dull tawny buff, also barred across and tipped with dark brown, the tawny interspaces on the external web vermiculated with brown, the internal ones clear rufous and margined with white; tertiaries mottled with fulvous and brown. Lower back, rump and upper tail-coverts clear fulvous or tawny buff, vermiculated at the tips, and with irregular narrow bars of brown. Tail tawny with seven brown bars, the central feathers brown with much mottled fulvous bars. Loreal plumes white, with black shafts at the tip. A small black patch above the eye. Cheeks whitish; ear-coverts dirty fulvous, the feathers tipped black and with dark shafts. Ruff blackish, the feathers edged with fulvous. Chin white. Throat with a band of stiff fulvous feathers, mesially streaked with brown; below this a patch of white, some of the feathers of which with mesial brown streaks. Breast and sides of the neck light yellowish buff, the feathers mesially streaked and finely

spotted with dark brown; abdomen, flanks and thigh-coverts buffy white, with narrow transverse wavy bars of brown, the feathers of the lower breast with distinct mesial streaks; under tail-coverts fulvous, with narrow wavy brown bars. Tarsal plume buffy white, fulvous on the sides and behind, and with a few indistinct brown markings. Under wing-coverts tawny buff, with narrow brown markings. Bill horny black; irides yellow.

Length.—20 to 22 inches, wing 16, tail 8·8 to 9, tarsus 2·95 to 3.

Hab.—The Peninsula of India and Ceylon; also Beloochistan, Afghanistan, and Nepaul. In India it has been recorded from Behar, Kutch, Kattiawar, Jodhpore, North Guzerat, the Neilgherries, Mhow, Malabar Coast, the Concan and Deccan. In Sind it is a permanent resident, breeding in March and April, laying from 2 to 4 eggs of a creamy white colour.

Bubo coromandus, *Lath. Ind. Orn.* i. p. 53; *Sharpe, Cat. Striges. B. M.* p. 35. Bubo coromanda, *Gray, Gen. B.* i. p. 37; *Hume, Str. F.* p. 164. Urrua coromanda, *Hodgs. J. A. S. B.* vi. p. 373; *Jerd. B. of Ind.* i. p. 130, No 70; *Hume, Nest and Eggs. Ind. B.* p. 63; *Murray, Hdbk., Zool., &c., Sind.*, p. 118. Ascalaphia coromanda, *Blyth, Ibis.* 1866, p. 253; *Hume, Rough Notes,* ii. p. 371.—The Dusky-horned Owl.

Adult.—Head, neck, ear-tufts, back, rump, scapulars and upper tail-coverts greyish brown, the feathers thickly vermiculated, crossed with numerous narrow fulvous bars, and with dark mesial streaks. Loreal plumes greyish white with dark shafts to the tips. Ear-coverts dark grey with black shafts, a black patch on the hinder edge of the ear-coverts. Chin whitish, quills ashy brown, the primaries tinged with fulvous and crossed with broad bands of dark brown. Outer scapulars with yellowish-white spots forming a shoulder patch. Tail dark brown, with 4 broad fulvous bands and a buffy white tip. Entire under surface pale earthy brown with a fulvous tinge, the feathers mesially streaked with dark brown and faintly barred with zigzag lines. Thigh-coverts and tarsal plume fulvescent, with narrow bars of zigzag lines. Feet sparsely feathered. Claws horny brown. Bill greyish at the base, horny yellow at tip.

Length.—21 to 23 inches, wing 16, tail 9, tarsus 2 to 2·65.

Hab.—Sind, N. W. Provinces (Futtehgur, Delhi), Oudh, Nepaul, Lower Bengal, Lower Himalayas, the Carnatic, Malabar Coast, Rajputana and North Guzerat. Like the last it is a resident in Sind. Breeds in December.

Gen. **Scops.**—*Sav.*

Ear-tufts large. Ear orifice moderate. Lateral margin of bill somewhat curved. Cere not inflated; nostrils oval, situated in the anterior margin of the cere. Wings long, reaching nearly or quite to the tip of the tail; 3rd and 4th quills longest; tail short; toes generally feathered; tarsi never naked.

Scops pennatus, *Hodgs. J. A. S. B.* vi. p. 369 (pt.); *Blyth, J. A. S. B.* xiv. p. 183; *Str. Feathers*, iii. 38; vi. 34; vii. 180. Ephialtes pennatus, *Jerd. B. Ind.* i. p. 136, No. 74; *Murray, Hdbk., Zool., &c., Sind*, p. 119; *Sharpe, Cat. Striges*, p. 53 (Sub-Sp. B.)—THE INDIAN SCOPS OWL.

This little owl is very similar to *S. giu*, but of a greyer colour ordinarily. Specimens from Sind are usually of the rufous phase. Jerdon describes both phases, which I extract.

Adult.—Above ashy grey, more or less tinged with rufous or rufous-grey, the feathers dark-shafted, finely mottled with brown and with a white subterminal spot; wings more rufescent and without the white spots, except on the outer scapulars as usual, and some of the greater coverts; quills rufescent, with darkish double bars, the interval between the bars dusky or mottled, and the light spaces or ground colour, on some of the outer primaries, rusty white in some specimens, or it may be said that the quills are dusky rufescent, mottled with pale bands; the tail rufescent with double bars, in some mottled almost throughout; beneath, the feathers are streaked dark brown, banded with white, and mottled rufous-grey and brown, mostly grey on the upper part and white on the lower part of the abdomen; tarsal feathers barred and mottled; disk ashy white, with a few darker specks, and the shafts of the frontal bristles white; ruff marked with dark brown and rufous.

In the rufous phase, the upper parts are uniform bright golden chestnut red, with black shafts, inconspicuous on the back, more distinct on the forehead, ear plumes and shoulders of the wings; outer edge of scapulars whitish; disk rufous with some of the feathers white-shafted; ruff deep brown with the outer feathers black tipped or black; beneath deeply tinged with the hue of the back, but with more or less white on the belly and under tail-coverts; the breast and sides of the belly with brownish central black streaks, the latter with transverse pencillings; four faint bars on the inner webs of the tail feathers, and the primaries also distinctly barred with dusky or mottled. The young bird has all the feathers duller red, more black-shafted, and there is much white on the lower surface; the disk too has a good deal of white; scapulars white externally, with black tips, and the bars on the quills and tail feathers are more distinct, brown and mottled. Bill dusky greenish; iris pale golden yellow; feet fleshy grey.

Length.—7½ to 8 inches, wing 5 to 6, tail 2½ to 3.

Hab.—Sind, Kutch, Rajputana, Concan, Deccan, South and Central India, Bengal, Punjab, N. W. Provinces and Oudh; Nepaul, Beloochistan and Afghanistan. Recorded also from Upper Pegu, Malacca and Tennaserim.

In Sind it appears to be a winter visitant.

Scops brucei, *Hume, Str. Feathers*, i. p. 8; *id.* v. 245; *Murray, Hdbk., Zool., &c., Sind*, p. 119; *Sharpe, Cat. Striges*, p. 63.—THE STRIATED SCOPS OWL.

Cheeks and feathers under the eye greyish white excessively finely and indistinctly barred with brown. The lores and stripe running up from them to the top of the eye creamy white. The longer feathers that meet over the base of the upper mandible tinged brownish, a few tiny dark brown feathers on the eyelids. Chin and throat creamy white, with very narrow central shaft-stripes towards the tips and excessively finely vermicillated with brown. Feathers of the ruff, which is inconspicuous, very pale buff, narrowly edged with dark brown. The whole of the forehead, crown, back of head, back and sides of neck, back scapulars, wing-coverts, rump, and upper tail-coverts, very pale buff or creamy white, so minutely and closely powdered with pale brown, that looked at from a little distance, the feathers appear to be a uniform pale earthy brown. Every feather has a narrow central dark-brown stripe, some of the outer scapulars have inconspicuous patches of buff on their outer webs, and the ground colour of the feathers on each side of the crown immediately above the eye is slightly paler; but beyond this the whole of the upper plumage above described is singularly uniform in tint and appearance, and is absolutely devoid of those white spots and blackish brown or buff dashes and streaks so characteristic of the other Indian species. The primaries are pale dingy buff, with broad transverse brown bars, which towards the tips are with the ground colour mottled and freckled over, the ground colour with brown, and the bars with dingy fulvous. Nearer the base of the feathers, the light bars are on the exterior webs pure pale buff, while the dark bars continue freckled as already described. On the inner webs, the dark bars are nearly uniform and unmottled, while the light bars are pure and unmottled towards the edge of the webs, and suffused with brown towards the shafts. The tertiaries and the tips of the secondaries approximate closely to the plumage of the back and coverts. Of the breast and abdomen, the ground colour is similar to that of the upper parts, but the brown powdering is coarser, so that more of the ground colour is seen, and the dark brown central shaft-stripes are somewhat broader; towards the vent, on the flanks and lower tail-coverts, the ground colour becomes almost pure white and the brown powdering very sparse, while the shaft-stripes are reduced as on the back and wing-coverts to well-marked dark lines. The short dense tibial and tarsal plumes are brownish white, each little feather with its dark central shaft-stripe. The axillaries and wing lining are cream-coloured or yellowish white, entirely unstreaked and unmottled.

The legs and feet, including the base of the toes, densely feathered, terminal portions of toes with small transverse scutæ, slate coloured; claws black, well curved, slender, and very sharp; toes very slender, but pads largely developed, so as to make a broad sole; exterior toe more or less versatile; irides bright yellow; bill dusky.

Male, Length.—9 inches, expanse 22 inches, wing 6·4 inches, tail 3·25 inches, tarsus 1·45 inches, foot greatest length 1·87 inches, greatest width 1·75 inches, mid-toe to root of claw 0·8 inch, its claw straight, 0·39 inch, hind toe 0·35 inch, its claw straight, 0·28 inch, inner toe 0·67 inch, its claw straight, 0·4 inch. Bill straight from

forehead to point including cere, which is ill-defined, 0·7 inch, from gape 0·73 inch, height at front at margin of cere 0·29 inch, wings when closed are even with the end of tail. Lower tail-coverts reach to within 0·9 inch of end of tail. The third and fourth primaries are the longest; the first is 0·75 inch, and the second is 0·08 shorter. The exterior tail feathers are 0·3 inch shorter than the central ones. Weight 4 oz. (*Hume, Stray Feathers,* vol. i. p. 8.)

Hab.—Sind, Beloochistan, Afghanistan and Gilgit; also Ahmednuggur (Deccan) and Western Khandeish. Less common than *E. pennatus,* and occurs in Sind only during the winter months.

Scops malabaricus, *Jerd. Madr. Journ.* x. p. 89; *Sharpe, Cat. Striges,* p. 94. Sub-Sp. B. Scops griseus, *Jerd. Madr. Journ.* xiii. pt. 2, p. 119. Scops lettoides, *Blyth, J. A. S. B.* xiv. pl. i. p. 182. (*ex. Jerd. Ms.*) Ephialtes malabaricus, *Hume, Rough Notes,* ii. p. 402; *Jerd. Ibis.* 1871, p. 348. Scops indicus, *Gmel. Stray Feathers,* v. 135; vii. pp. 359, 506. Scops bakkamæna, *Forst.*; *Hume, Nest and Eggs, Ind. B.* p. 69. Ephialtes griseus, *Hume, Rough Notes,* p. 398; *Murray, Hdbk., Zool., &c., Sind,* p. 121.—The Malabar Scops Owl.

A prominent tuft of disunited-webbed, bristly white feathers (with dark naked tips to the shafts, and traces on those nearest the eye of dark cross bars,) on each side of the upper mandible at its base; a faint tinge of buffy at the anterior angle of the eye; rest of the lores, feathers below and behind the eye, including ear-coverts, loose-webbed, silky, and greyish white, with traces of faint minute transverse brown bars; chin white; the feathers of the extreme tip somewhat bristly and curving upwards round the lower mandible; across the throat and upwards, immediately behind the ear orifice, as far as the base of the aigrettes, a band of creamy or pale buff feathers, with numerous minute, transverse, wavy brown pencillings and bars; those from the aigrettes to the sides of the throat with conspicuous dark brown tippings, which form the defining line of the disc, and a few of those in the centre of the throat with similarly coloured spots at the tips; forehead and a broad supercilium running up the inside webs of the aigrette feathers, and a curved band at the back of the head, extending from the point of one aigrette to the point of the other, a silvery grey or greyish white, the feathers with dark brown shafts and numerous minute transverse pencillings of that colour, and some of them with terminal spots; centre of forehead and top of head, a triangular space surrounded by this grey band, a rich dark brown, purest on the centre of the forehead, with small twin spots or imperfect transverse bars and mottlings, to a greater or less extent, of pale buff; the outside webs of the aigrettes are similar, as are the feathers of the band outside and contiguous to the curved grey band, which latter seems continuous with the dark line of the outer webs of the aigrette, while the former seems to start immediately above the centre of the eye; below the dark band, at the base of the neck, is another band of very similarly marked feathers, but whereas the dark brown predominates in the former, the buff much predominates in the latter. The back, rump,

upper tail-coverts, scapulars, wing-coverts, except the greater ones of the primaries, a mixture of pale brownish grey and pale buffy, with dark brown central streaks, and numerous transverse wavy brown pencillings and mottlings. In the outside line of the scapulars the buff is very pure, and in some positions conspicuous, and while the rump, upper tail and lesser wing-coverts are dingier and greyer, the centre of the upper back and the median and secondary wing-coverts show more of a pale buff; the primary greater coverts are very dark brown with broad transverse buffy mottled bars; the quills are darkish brown, with numerous broad transverse greyish more or less dingy white bars, much more conspicuous on the outer webs; with the exception of a few bars on the upper portion of the outer web of the earlier primaries, which are unmottled and slightly tinged with creamy, all the rest of these bars are closely mottled and pencilled with brown; the second, third and fourth primaries are just perceptibly emarginate on the outer webs, and the first to the fourth are conspicuously notched on the inner webs; the sides of the neck behind the dark line, the breast, sides, abdomen, thigh-coverts, a sort of creamy grey, very soft and silky, the feathers with narrow rich brown central streaks and numerous minute irregular, wavy, transverse pencillings; greater portion of wing lining, vent feathers and lower tail-coverts, silky greyish white, the latter, some of them, with dark central streaks towards the tips; tarsal feathers silky greyish white, with a faint buffy tinge towards the joint, and with several narrow, somewhat irregular transverse brown bars; tail feathers greyish brown with imperfect transverse mottled bars of very pale dingy buff, and with the interspaces, too, more or less mottled with the same colour. Toes and claws pale greyish brown. Soles creamy white; pads and papillæ much developed and soft; irides brownish yellow or dark brown; bill dark brown; cere dusky grey.

Length.—7·88 to 9 inches, wing 5·6 to 6·75, tail 2·5 to 3·37, tarsus 1·06 to 1·19.

The above is Mr. Hume's description of *Scops indicus, Gm.*, which, he says (on page 506, vol. vii. *Str. F.*) is identical with *Scops griseus* (*malabaricus* of *Sharpe, Cat. Striges, B. M.*) and *Scops bakkamœna* of *Forster*. Sharpe, however, does not in his references to the literature of this species allude to the names given by Gmelin and Forster.

Hab.—Sind, Punjab, Oudh, Madras, Malabar Coast, Travancore, Ceylon, Eastern and Western Ghauts, and North Guzerat. Like the preceding species, it is uncommon in Sind and affects wooded districts only.

Gen. **Carine.**—*Kaup.*

Cere swollen; 1st primary much lengthened; 5th escolloped on the outer web like the fourth; hind tarsus plumed; nostril pierced near the anterior margin of the cere; bill short, curved from the base, hooked; lower mandible notched.

Carine brama, *Tem. Pl. Col.* ii. pl. 68. *Sharpe, Ibis,* 1875, p. 258; *Cat. Striges,* p. 139. Noctua indica, *Frankl. P. Z. S.* 1831, p. 115. Athene brama, *Blyth, Ann. N. H.* xii. p. 93; *Gray, Gen. B.* i. p. 34; *Jerd. B. Ind.* i. p. 141, No. 76; *Murray, Hdbk., Zool., &c., Sind*; *Hume, Rough Notes,* ii. p. 404.—THE SPOTTED OWLET.

Adult.—Above greyish brown, each feather with two white spots; the scapulars barred with white, more broadly on the outer webs; wing-coverts concolorous with the back, and spotted with white; primaries and their coverts brown, externally notched with white, and barred on the inner web; upper tail-coverts and tail brown, also barred with white; head and hind neck closely spotted with white; lores, eyebrow, chin, a demicollar and patch on the breast pure white; ear-coverts brown, the feathers tipped with greyish; foreneck white, the tips of the feathers brown, forming a brown band between the white patch of the breast and foreneck; rest of under surface white, barred transversely with brown; under tail-coverts, tarsal plumes, and under wing-coverts pure white, the latter streaked with brown; cere dusky; bill greenish horny; toes sparsely covered with stiff bristles; irides bright yellow.

Length.—9 inches, wing 6, tail 3 to 3·5, tarsus 1·4.

Hab.—India generally to the foot of the Himalayas. Extends into Beloochistan, Persia, Afghanistan, Burmah and Ceylon. Extremely common in Sind, the Punjab, Deccan and Concans, North Guzerat Kutch, Kattiawar, and Jodhpore, and is a resident wherever found. Breeds in Sind in February and March. Eggs 4, pure white, oval.

Sub-Family, SYRNIINÆ,—HOOTING OWLS.

Asioninæ, (*pt.*) *Vigors.*—Head large, with ear tufts; ear-conch with large operculum, facial disk distinct; wings long, 2nd and 3rd quills longest; bill short, curved from the base; toes feathered.

Gen. Asio.—*Briss.*

Characters, same as those of the Sub-Family.

Asio otus, *Lin. S. N.* i. p. 132; *Sharpe, Cat. Striges,* p. 227. Otus vulgaris, *Fleming, Brit. An.* p. 56; *Gray, Gen. B.* i. p. 40; *Gould. B. Eur.* pl. 39; *Jerd. Birds Ind.* p. 125, No. 67; *Loche Exp. Sci. Alger. Ois.* p. 96; *Hume, Rough Notes,* ii. p. 363; *Murray, Hdbk., Zool., &c., Sind,* p. 121. Otus communis, *Less. Traité.* p. 110.—THE LONG-EARED OWL.

Head, neck, and breast yellowish brown, or tawny yellow, with mesial dark brown longitudinal streaks to the feathers, many of which are margined whitish and pencilled with dusky brown; ear-tufts 1-1½ inch, brownish black in the middle, edged tawny, the upper edge of the inner web whitish; forehead finely mottled, whitish, dusky and ferruginous; face dusky white with hair-like lines of black; feathers round the eye blackish; ear-coverts yellowish, tipped with dusky brown; facial ruff white, the feathers tipped with black; chin white; throat with stiff

feather in continuation of the ruff, spotted and centred with dark brown; rest of under surface orange-buff, sometimes whitish, with a broad mesial streak of dark brown, the feathers of the abdomen having also dusky frecklings. Under wing-coverts buffy or light tawny, a few of the feathers narrowly lined with brown. Back dusky brown, much mottled with orange-buff and whitish; wing-coverts and scapulars with a large oval spot on the outer web. Edge of wing white; wing underneath yellowish white, the dark bars on the inner webs distinct. Primaries dusky brown, with bars of tawny or reddish yellow, the tawny interspaces towards the tips of the feathers narrow, and vermiculated with brown; the tips entirely brown. Secondaries greyish white, barred with dusky; the margins of the inner webs buffy; upper tail-coverts yellowish brown, edged and vermiculated with dusky brown. Under tail-coverts white, the shafts towards the tips of some of the feathers with a broad dusky spot. Tail tawny buff or yellowish brown, crossed by seven bands of dark brown and vermiculated near the tip, the outer feathers with ten narrow dark brown bands. Tarsal plumes tawny or yellowish buff and unspotted. Bill of a dusky horny colour. Irides orange yellow.

Length.—13·5 to 14 inches, wing 11·75, tail 6, tarsus 1·6.

Hab.—Throughout Europe, across Siberia to Japan and China (*Sharpe*); the Himalayas from Nepaul to Cashmere, N. W. Provinces, the Punjab and Afghanistan. It is also recorded from Eastern Turkistan, N. Africa and Egypt. In Sind it is a winter visitant.

Asio accipitrinus, *Pall. Reis. Russ. Reichs.* i. p. 455; *Sharpe, Cat. Striges,* p. 225. Strix brachyotus, *Forst. Phil. Trans.* lxii. p. 384; *Gm. S. N.* i. p. 289. Otus brachyotus, *Steph. Gen. Zool.* xiii. pl. 2, p. 57; *Jerd. B. Ind.* i. p. 127, No. 68; *Gurney, Ibis,* 1868, p. 150; *Hume, Rough Notes,* ii. p. 364; *Murray, Zool., &c., Sind,* p. 118. Asio brachyotus, *McGill. Br. B.* iii. p. 461. Asio accipitrinus, *Newt. Ed. Yarr. Brit. B. Shelley, B. Egypt.*—The Short-eared Owl.

Adult.—Above head, neck and back dark brown, the feathers broadly margined with ochraceous buff; the scapulars much paler on their outer margins, and with brown irregular markings, which form ovate spots of whitish buff. Secondaries brown, mottled with ochraceous buff and tipped and margined on the inner web with whitish buff; primary coverts dark brown with a few ochraceous spots. Quills ochraceous buff, tipped whitish and with dark brown bands, which are distinct on both webs. Upper tail-coverts ochraceous, faintly edged with a darker shade; under tail-coverts pale fulvous, with a mesial dark streak on some of the feathers; tarsal plumes unspotted ochraceous. Ear-tufts 0·5 inch long; chin whitish, in some specimens buffy. Ruff whitish, or whitish buff, and speckled with spots of brown; plumes above the eye whitish buff, with mesial dark brown streaks; facial aspect dull white, the lores brownish; feathers round the eye black; ear-coverts ochraceous, with narrow black shaft-lines. Breast and entire under parts ochraceous buff, streaked with dark brown mesially, these streaks narrowing into linear shaft-lines on the lower breast and

abdomen. Under wing-coverts buffy white, with a few dark streaks. Tail dark brown, whitish at tip, and with 6 bars of ochraceous buff mottled with brown. Cere and bill brownish black.

Length.—14 to 15 inches, wing 13, tail 5 to 6, tarsus 1·75. *Female, length* 15·5 inches, wing 12·5, tail 6· 7, tarsus 1·85.

Hab.—Throughout Europe, and nearly all India; it occurs in Beloochistan, Persia, Egypt, East Turkistan, Gilgit, (Cashmere) and Nepaul; also in the Punjab, N. W. Provinces, Oudh, Bengal, Central and Southern India, Kutch, Guzerat, Rajputana, the Concan and Deccan. In Sind it is a winter visitant, and is not uncommon, especially in the Northern and Central parts, keeping to low jungle and long grass.

Family, STRIGIDÆ.

Head large, densely feathered. Eyes surrounded with a circle of radiating feathers; between the anterior portion of the facial area a frontal patch of small stiff feathers always present and broad. Bill short, covered by stiff bristles. Feet feathered to the toes.

Sub-Family, STRIGINÆ.

Disc complete; ears operculated.

Gen. **Strix**.—*Linn.* (*in pt.*)

Nasal fossæ large; nostrils lunated. Wings reaching far beyond the tail; tail short, slightly rounded; 2nd quill longest; tarsi scantily feathered.

Strix flammea, *Lin. S. N.* i. p. 133; *Tem. Man. d'Orn.* i. 91; *Gould. B. Eur.* i. pl. 36. Strix Javanica, *Gm. S. N.* i. p. 295; *Jerd. Mad. Journ.* x. p. 85; *id. Birds of Ind.* i. p. 117, No. 60; *Hume, Nest and Eggs, Indian Birds*; *Murray, Hdbk., Zool., &c., Sind.*, p. 119. Strix indica, *Blyth, Ibis*, 1860, p. 25; *Hume, Rough Notes*, ii. p. 342; *id. Str. F.* 1873, p. 163 *et* 1875, p. 37.—The Indian Screech Owl.

Head pale buff, mottled with light grey, each feather tipped with a white spot and edged darker. Neck silky white, sometimes tinged yellowish and with small brown spots; the ruff the same, with darker tips; chin, throat, and breast, and under parts white, the feathers of the breast and abdomen with small black specks. Scapulars and back pale buff, mottled with grey, each feather with a terminal dark-edged white spot. Primaries buff on the outer web and paler on the inner, edged with white and barred with brown, the outer web finely speckled. Tail pale buff with 4—5 dark bars, the tip whitish, and the inner web of the lateral feathers pure white. Under tail-coverts and tarsal plumes white; under wing and thigh-coverts white with small dark spots; facial disc pure white with a rufous spot in the corner of each eye. Bill yellowish white; irides black; cere flesh coloured.

Length.—13 to 14 inches, wing 11, tail 2·5, tarsus 2·5 to 2·75.

Hab.—Throughout Europe, India and Ceylon, extending through Burmah to Malayana. In Sind it is perhaps a resident, specimens having been obtained in April, July and November.

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ORDER, INSESSORES, *Vigors.*—PASSERES OR PERCHING BIRDS.

Toes usually three in front, one behind, or with two before and two behind by the outer being carried behind.

Tribe, FISSIROSTRES.

Bill very wide, the gape beneath the eyes. Keel curved to tip. Prey on the wing.

Family, HIRUNDINIDÆ.

Bill short and weak, very broad at base, suddenly compressed to tip; wings long, sharp and narrow; tail forked; tarsi weak.

Sub-Family, HIRUNDININÆ,—SWALLOWS.

Bill short, sides gradually compressed to tip; nostrils at base of bill rounded. 1st quill longest; tail forked; toes mostly long and slender.

Gen. **Hirundo.**—*Lin.*

Nostrils partly covered by membrane; exterior feathers of tail sometimes much lengthened.

Hirundo rustica, *Lin. S. N.* i. p. 174. *Naum. vogt.* t. 383·2; *Gould. B. Eur.* pl. 54; *Jerd. B. Ind.* p. 157, No 82; *Murray, Hdbk., Zool., &c., Sind.*—THE COMMON SWALLOW.

Male.—Forehead light chestnut; body and wings glossy steel blue; primaries and secondaries black; tail feathers black, with a large white spot on the inner webs of all except the mesial ones; throat chestnut; a dark blue band across the upper part of the chest; rest of under parts white or rufescent white. Bill, legs, and feet black.

Length.—To end of outer tail feathers 7·5 inches, of which the tail is 4·5; middle tail feathers 2 inches, wing 4·8. The female is distinguished by the smaller chestnut patch on the forehead, less intense tints, whiter under parts, and the narrowness of the band across the chest.

Hab.—Europe, Palestine, Africa, Natal, Malacca, Penang, Tennaserim, Burmah, Sumatra, Borneo, China, and Celebes; also Persia, Beloochistan, Afghanistan, Eastern Turkistan, Nepaul, and the whole Continent of India and Ceylon. In Sind, as in other parts of India, it is a winter visitant. Said to breed in Persia at heights from about 4,000 to 8,000 ft. in the months of April and May.

Hirundo filifera, *Stephens; Jerd. B. Ind.* p. 159; *Str. F.* i. 164; *Murray, Hdbk., Zool., &c., Sind.*, p. 122. Hirundo filicaudata, *Franklin.*—THE WIRE-TAILED SWALLOW.

Head deep ferruginous; wings glossy steel blue; lores black; under parts white, a black patch upon the back of the thigh; outermost tail feathers filiform and elongated 5-6 inches beyond the rest; all the tail feathers, except the four central ones, are spotted with white.

Length.—To end of middle tail feathers 4·75, wing 4·5.

Hab.—Throughout India and Cashmere; also Beloochistan (Quetta), and Afghanistan. In Sind it arrives about the latter end of July, and breeds in the Province. All the nests, taken by myself and Lieut. Henry Barnes, were in July and August, and a few in September. It builds a shallow cup or saucer-shaped nest of clay, lined with feathers, generally under bridges and culverts, and on the Indus, under the stern of the flat-bottomed barges lying unused. Eggs 2—4, white, speckled all over with rusty or brick-red.

Hirundo daurica, *Linn. S. N.* i. p. 702, *Naum. vogt.* t. 383, p. 4; *Gould. B. As.* pl. 51; *Murray, Hdbk., Zool., &c., Sind,* p. 122; *Jerd. B. Ind.* p. 160. Hirundo rufula, *Tem. Man. d'Orn.* ed. ii. pt. iii. p. 298. Hirundo erythropygia, *Sykes; Str. F.* v. 255. Hirundo alpestris, *Pallas. Zoogr.* i. pl. 30.—THE RED-RUMPED SWALLOW.

Above blue-black; sides of the head, supercilium, behind the ear-coverts, and rump chestnut; under parts rufescent white, with dusky streaks; under tail-coverts tipped broadly on the terminal half, with black.

Length.—7·5 inches, wing 4·5, tail 4.

Hab.—All over India to Nepaul, Himalayas, Siberia, N. E. Asia, Persia, Beloochistan and Afghanistan. In Ceylon rarely. Occurs in the Deccan, Kutch, Kattiawar, Rajputana and N. Guzerat; also the Punjab, N. W. Provinces, Oudh, Bengal, Central and Southern India. In Sind it visits us during winter.

Gen. **Cotyle.**—*Boie.*

Bill flat; nostrils prominent; tail moderate, slightly forked; tarsi scaled and slender.

Cotyle riparia, *Linn.; P. C.* 523; *Naum. vogt.* t. 146, 3, 4; *Gould. B. Eur.* pl. 51; *Audubon Birds Amer.* pl. 50; *Jerd. B. Ind.* p. 163, No. 87; *Str. F.* i. 164; iii. 452; iv. 507; *Murray, Hdbk., Zool., &c., Sind,* p. 123.—THE EUROPEAN SAND MARTIN.

Head and body brown or dusky greyish brown; wings and tail sooty black; under surface white, except a brown band across the upper part of the chest; bill black; legs and feet horny; irides hazel.

Length.—To end of outer tail feathers 4·75, wing 4, tail 2, tarsus at back feathered to the hind toe.

Hab.—Central India, Kutch, the Punjab, Beloochistan (Quetta), Persia and Afghanistan. It is widely spread throughout Europe, Asia, and Africa. In Europe and Northern Asia it breeds in holes, in river banks. In Sind it is a winter visitant.

Cotyle sinensis, *Gray, Ill. Ind. Zool.* i. pl. 35, f. 3; *Jerd. B. Ind.* i. 164, No. 89; *Str. F.* iii. 42; *id.* vi. 45; *Murray, Hdbk., Zool., &c., Sind,* p. 123. Hirundo brevicaudata, *McClell.*—THE INDIAN BANK MARTIN.

Adult.—Above dusky greyish brown, darker on the crown; throat and breast pale grey; wings and tail dusky brown; belly and lower tail-coverts white; upper tail-coverts albescent; tarsus with a small tuft.

Length.—4·25 inches, wing 3·5, tail 1·75.

Hab.—India generally; rare in the south, numerous in Sind, Punjab, N. W. Provinces, Bengal, and Nepaul; also in Kutch, Kattiawar, Jodhpore, North Guzerat, the Deccan and Concan. It is recorded from N. Pegu and the Indo-Burmese countries to China. In Sind it is a resident, and breeds at Buggatora and upwards, towards, and beyond Sehwan, in holes in the river banks, about January.

Cotyle obsoleta, *Cab. Mus. Hein. Th.* i. p. 50; *Sharpe, P. Z. S.* 1870, p. 301; *Blanf. Ibis.* 1873, p. 214. Ptyonoprogne pallida, *Hume, Str. F.* vol. i. p. 1. 417; *Murray, Hdbk., Zool., &c., Sind,* p. 124.—THE PALE CRAG-MARTIN.

The whole upper surface a very pale greyish earthy brown, very much paler than the same parts in either *P. rupestris* or *Cotyle sinensis,* the quills only slightly darker, yet sufficiently so to contrast pretty markedly with the scapulars, back, rump, and upper tail-coverts; the lateral tail feathers and all but the external feather on each side, with a large oval white spot on the inner web, as in *rupestris,* and with dark shafts, and a darker tint on the web, near the shaft, as in that latter species. Lower surface as in *rupestris,* but much paler, the whole of the chin, throat, breast, and abdomen being white with only a faint fulvous or rufous tinge; wing lining and lower tail-coverts, the same pale earthy grey brown as the upper surface. Bill black; legs and feet horny brown; irides dark brown. (*Hume, S. F.* vol. 1, p. 417.)

Male, length.—5·35 to 6 inches, expanse 12·25 to 13, wing 4·4 to 4·7. *Female, length* 5·25 to 5·5, expanse 12·3, wing 4·5 to 4·75, tail from vent 1·8 to 2, tarsus 0·4.

Hab.—N. E. Africa; found also in Beloochistan, Kutch and N. Guzerat. In Sind it is less common than the preceding species, and generally affects hilly situations; arrives during winter.

Sub-Family, CYPSELINÆ.

Wings very long and curved, scimitar like; toes short, hinder ones generally directed forwards; claws curved and sharp.

Gen. **Cypselus.**—*Illiger.*

Bill with the sides gradually compressed to the tip; nostrils partially feathered; second quill longest; tail generally forked; tarsi short, plumed to the toes; toes all directed forward.

Cypselus melba, *Linn.; Edw.; B.* pl. 27; *Naum. vogt.* 147, i.; *Gould. B. Eur.* pl. 53, 2; *Jerd. B. Ind.* p. 175, No. 98; *Murray, Hdbk., Zool., &c., Sind,* p. 124.—THE ALPINE SWIFT.

Above wood-brown, glossy purple on the back; wings darker brown; under surface white, except a broad dusky bar across the breast; rump, on the sides, under tail-coverts and tarsal plumes brown; bill black; irides deep brown; toes brown with an orange tinge.

Length.—8 to 9 inches, wing 8·5 to 8·75, 2·5 inches beyond the tip of the tail, which is forked, and 3 inches in length; outer feathers 3·75.

Hab.—S. W. Europe, Palestine, W. Asia, Africa, Greece, Beloochistan, Afghanistan, Persia. In India it occurs as a migrant, passing through the Punjab, N. W. Provinces, Sind, Kutch, Kattiawar, Guzerat, and the Deccan during winter.

Cypselus apus, *Lin.*; *P. E.* 542, 1; *Naum. vogt.* t. 147, 2; *Gould. B. Eur.* pl. 53, 1; *Jerd. B. Ind.* p. 177, No. 99; *Hume, Str. F.* i. 65; *Murray, Hdbk., Zool., &c., Sind,* p. 125.—The European Swift.

The whole of the plumage is dark sooty-black, except a greyish white patch on the chin and throat; bill, legs, toes and claws black; irides brown; second primary longest in the wing, which reaches more than an inch beyond the tip of the tail; tail more forked than in the last.

Length.—7 inches, wing 6·25, tail 2·75.

Hab.—Europe, N. and E. Africa, W. Asia. Occurs in Persia, Beloochistan and Afghanistan; also in Sind, the Punjab, N. W. Provinces, Kutch, Kattiawar, and Jodhpore as a migrant.

Cypselus affinis, *Gray, Ill. Ind. Zool.* pl. 35, 2; *Jerd. B. Ind.* i. p. 177, No. 100; *Str. F.* i. 166; *Murray, Zool., &c., Sind,* p. 125.—The Common Indian Swift.

Upper surface brown-black, darker, and glossed greenish on the back; head brownish, forehead paler; under surface brownish black; chin, throat and rump white; bill black; feet brownish; irides deep brown.

Length.—5½ to 6 inches, wing 5, extends 1·5 beyond tip of tail, which is 1·75.

Hab.—Beloochistan, Persia, Afghanistan, Nepaul and Abyssinia. In India very generally distributed. Occurs in Sind, the Punjab, Deccan, Concan, Kutch, Kattiawar, Jodhpore, and N. Guzerat. It is a resident in Sind, and breeds in large colonies under the eaves of roofs and untenanted buildings. Eggs 2—4 in number, pure white.

Family, CAPRIMULGIDÆ.—Goatsuckers.

Bill short, flat, and broad; tarsi short; toes long, hind toe joined to inner at base.

Sub-Family, CAPRIMULGINÆ.

Bill with bristles at the base; wings long; tail rather long; tarsi short, scaled or plumed; middle toe longest, its claw long and serrated.

Gen. Caprimulgus.—*Lin.*

Nostrils at side and tubular; 2nd quill longest; tail rounded or forked; tarsi plumed; hind toe very short.

Caprimulgus unwinii, *Hume, Str. F.* iii. p. 407; iv. p. 501; vii. 175; viii. 180, 189, 236, 372; ix. 313, 215; *Ibis.* 1871, i. p. 406; *id.* 1877, pp. 249, 250; *Murray, Zool., &c., Sind,* p. 125.—Unwin's Night-Jar.

This species is a visitant to the province, and has hitherto been found at Hydrabad and in its neighbourhood, also in Beloochistan and Afghanistan, Nepaul, Gilgit, and Persia. Breeds in Afghanistan at Chaman, where Lt. H. E. Barnes obtained unfledged young birds. It arrives in September and remains till about the end of October, some

few being seen as late as the first week in November. Mr. Hume, in describing this species, says, "It has the upper three-fourths of the tarsus feathered in front. In both sexes the two outer tail feathers on each side are tipped with white; but the tippings are about 1·55 and 1·0 broad in the male on the outer and penultimate feathers, respectively, and only about 0·75 and 0·44 in the female, and in the latter sex, the white is less pure. Both sexes have a white spot on the inner webs of the first three, and a corresponding one on the outer webs of the second and third primaries; but here again, while the white spots on the inner webs of the male are about one inch broad, those of the female are about half that size." He adds "the best description I can give of its plumage is, that it is an excessively pale version of *C. Indicus*, and that while (with the exception of the difference in the size of the white markings on tail and wings) the sexes closely resemble each other, the under tail-coverts of the male are a uniform rufous buff, while those of the female are somewhat paler and are very distinctly barred with narrow bars more than a quarter of an inch apart"; but Mr. W. T. Blanford, in a letter to the "Ibis," vol. 1, 1877, pp. 249-250, states "that after examining all Mr. Hume's specimens of this species with specimens of *C. Europœus*, (a large English female and a male specimen from Europe,) the sex of one of the types of *C. Unwinii*, was probably wrongly determined, and that instead of being male and female, both skins are those of males, and that they are quite distinct from *C. Mahrattensis*, and belong to the pale grey race of *C. Europœus*, of which he obtained specimens in S. E. Persia." He adds "whilst the name of *C. Unwinii* must become a synonym, *C. Europœus* must be added to the Indian fauna."

The following is a description of *Caprimulgus Europœus, Linn.*:—

Plumage above and that of the throat ashy grey, thickly streaked and spotted with brown, mostly of a yellowish tinge; head and neck with longitudinal blackish streaks; a white stripe beneath the base of the lower mandible extends along each side of the lower part of the head, and there is a central patch of white upon the throat. Primaries, secondaries, and tertiaries dark brown; the outer webs blotched with reddish brown, and the three exterior feathers with a large white patch near the tips of the inner webs. Tail irregularly marked and indistinctly barred with blackish grey and yellowish brown; the two external feathers on each side white at their termination; plumage of under parts yellowish brown; tarsi paler. Female like the male, the white spots on quills and tail feathers absent.

Length.—10·3 to 10·6 inches, expanse 21 inches, wing 6 to 6·2, tail 4·5 to 5.

Caprimulgus asiaticus, *Lath; Gray, Ill. Ind. Zool.* i. pl. 34 f. 2; *Hume, Str. F.* vii. p. 169; *id.* viii. pp. 236, 417; *id.* ix. pp. 48, 150, 380; *Jerd.* i. p. 197, No. 112; *Murray, Hdbk., Zool., &c., Sind*, p. 126.—The Common Indian Night-Jar.

Plumage remarkably soft and lax, pale rufescent ashy; the feathers finely pencilled and mottled with dusky; top of head with narrow

longitudinal blackish streaks; neck with a white spot; collar rufescent. Wing-coverts and scapulars edged with buffy or tawny; quills with a white spot on each of the first four feathers, and mottled at the tip; the exterior feathers with a large white patch near the tips of the inner webs; a central patch of white on the throat. Lower parts and tail irregularly barred and mottled lightly; the tail, in the male, with white spots on the outer tail feathers; tarsi bare.

Length.—9 inches, extent 18 to 18·5, wing 5·5 to 6, tail 4·5.

Hab.—Very widely spread in India and Ceylon. Occurs in Sind, the Concan and Deccan, Kutch, Kattiawar, and North Guzerat; recorded also from Upper Pegu and Amherst.

Caprimulgus mahrattensis, *Sykes; Jerd. Ill. Ind. Orn.* pl. 24; *Gould. B. Asia; Jerd.* i. p. 197, No. 113; *Hume, Str. F.* i. 167; iii. 206, 331, 455; iv. 251, 501; vii. 181; viii. 372; ix. 381; *Murray, Hdbk., Zool., &c., Sind*, p. 127.—SYKES' NIGHT-JAR.

The general colour is a pale sandy-grey, variegated with pencillings of dusky and ferruginous; head very sparingly streaked and spotted; breast with a white spot; wing-coverts, scapulars, and tertiaries, with buffy spots; primaries with a white spot on the outer webs of the three exterior feathers, mottled grey at the tip and with fulvous bands; tail pale grey; the central feathers finely vermiculated; the rest with zigzag pencillings or bands of black, tipped fulvous and spotted on the two lateral feathers with white; under tail-coverts fulvous.

Length.—8·75 to 9·5 inches, wing 6·75 to 7, tail 4·5 to 5.

Hab.—India generally and Ceylon. A permanent resident in Sind, breeding on the plains in February and March. Probably a resident also of Kutch, Kattiawar, N. Guzerat, and Jodhpore. Occurs in the Punjab (Dera Ghazi Khan) Beloochistan and the Deccan, also in Upper Pegu, where it is recorded to have been found.

Family, MEROPIDÆ,—BEE-EATERS.

Bill long; both mandibles curved and sharp; nostrils partly hidden by short bristles; wings long and pointed; tail long and broad; central feathers generally elongated; tarsi short; toes long, two exterior united to middle; hind toe with a pad beneath.

Gen. **Merops**.—*Linn.*

Second quill longest; tail with two middle feathers elongated; tarsi scaled; outer toe longer than inner; wings reaching two-thirds the length of tail.

Merops viridis, *Linn.; Edw. B.* pl. 83; *Lev. Guep.* t. 10, 11; *Jerd. B. Ind.* i. p. 205, No. 117; *Hume, Str. F.* i. 167; iii. 49; iv. 304; vi. 67; vii. 35, 54, 77, 203, 258, 365, 370; ix. 48, 152, 381.

Above bright grass green; below bright green, mixed with verdigris; lower abdomen and under tail-coverts slightly paler and with a bluish tinge; head, nape, and hind neck burnished with golden; eye streak from base of bill through the eye to ear-coverts, and a

collar on top of the breast, black; quills reddish, tipped dusky; tail very dull green, the edges of their inner webs dusky; elongated portion of the two central feathers dark brown; bill black; irides blood red.

Length.—9·75 inches to tip of central tail feathers, wing 3·5 to 3·75, bill at front 1·1.

Hab.—The whole of India, extending to Ceylon and Indo-China. Occurs also at Quetta in Beloochistan, Persia and Egypt; also in Southern India (Travancore) Nepaul and Cashmere.

Merops phillipinus, *Linn.*; *P. E.* 57. *Jerd. B. Ind.* p. 207, No. 118; *Hume, Str. F.* ii. 162; ix. 152, 381; *Murray, Hdbk., Zool., &c., Sind*, p. 127.—THE BLUE-TAILED BEE-EATER.

Distinguished from the last, *M. viridis*, by the upper parts being dull green; the rump and upper tail-coverts azure blue; the chin yellowish white; tail dull blue; throat and sides of the face ferruginous; under tail-coverts pale blue; irides crimson.

Length.—12 to 12·5 inches, wing 5·25.

Hab.—Throughout India and Ceylon.

Merops persicus, *Pall. Reis. App.* p. 708; *Zoogr. Ros.* p. *As.* i. p. 440; *De F. Viag. in Pers.* p. 346. M. Ægyptius, *Forskahl, Desc. de'l Egypt*, p. 1; *Jerd. B. Ind.* p. 210.

Distinguished from *M. viridis* and *M. phillipinus* by a narrow yellowish white line on the forehead, edged by another pale blue one, which continues over the eye as a supercilium; a white line edged with blue from the gape running below the streak through the eye; chin yellow; throat deep chestnut.

Length.—12 inches, wing 6, tail 3·25.

Hab.—Throughout Asia Minor, Beloochistan, Persia, Arabia, Egypt, Africa, E. and South Europe, and India. In Sind and the Punjab common.

Merops apiaster, *Linn.*; *P. E.* 938; *Naum, vogt.* t. 143; *Lev. Guep.* t. 1, 2; *Jerd. B. Ind.* p. 210, No. 121; *Hume, Str. F.* vol. vii. p. 453; *Blanford, Eastern Persia*, ii. p. 122; *Murray, Hdbk., Zool., &c., Sind.*—THE EUROPEAN BEE-EATER.

Top of head rich chestnut brown, also the neck, upper back, wing-coverts and secondaries; forehead dull white, passing into pale verdigris green; chin and throat bright yellow; a bluish black streak from the base of the bill through the eye descending to a narrow black ring, which encircles the neck. Primaries narrow and pointed, dusky on the inner webs, fine greenish blue on the outer, the tips and shafts black; secondaries also tipped black; tertiaries blue green; larger and lesser under wing-coverts fawn colour; lower back yellow tinged with chestnut and green; tail greenish blue or dull green; the two middle feathers darker, tipped blackish, and elongated beyond the rest; upper tail-coverts bluish green, with a yellowish tinge; breast and lower parts greenish blue; under tail-coverts pale blue; bill black, long and curved, and with a strong blunt ridge; legs reddish brown; claws reddish black. The plumage of the female is less bright; the central tail feathers shorter than in the male.

Length.—10 to 11 inches, wing 5·75, tail 3·75.

Hab.—Europe, N. and W. Africa, Palestine, Arabia, Egypt, Cashmere, Persia, Beloochistan, Afghanistan, and Asia Minor. In India it occurs as a bird of passage in the Punjab, N. W. Provinces, Sind, Kutch, Kattiawar, Rajputana, and the Deccan. Colonel St. John (*Zoology of Eastern Persia*) remarks, that it is common throughout the summer in Persia at 2,500 to 6,000 feet elevation, breeding in company with sparrows, pigeons and rollers.

Family, CORACIADÆ,—Rollers.

Bill long and broad at the base, tip hooked; nostrils at the base, oblique, linear, apert; gape with strong rictal bristles; wings and tail moderately long; 2nd quill longest; tarsi short.

Gen. Coracias.—*Lin.*

Characters same as those of the Family.

Coracias indica, *Lin.*; *Edw. B.* pl. 326; *P. E.* 285; *Jerd. B. Ind.* p. 214, No. 123; *Hume, Str. F.* vii. 259; *Murray, Hdbk., Zool., &c., Sind*, p. 128.—The Indian Roller.

Forehead rufescent brown; head and nape greenish blue; supercilium light blue; hind neck, scapulars, upper back and tertiaries ashy or earthy brown, tinged on the hind neck with vinous; lower back greenish blue; rump, upper tail-coverts, lesser coverts, and shoulders cobalt blue, some of the feathers of the upper tail-coverts tipped greenish. Winglet and primaries pale blue, the latter with a broad band of violet blue in the middle and tipped dark blue; secondaries violet blue, the margins of their inner webs dusky, and the basal half of their outer ones dark green, shading into light blue on their outer margins. Tail with the middle feathers dull green, the rest violet blue with a pale sky blue band. Chin light fulvous; throat and breast of a vinous colour, with light fulvous shaft-stripes, passing into isabelline on the upper abdomen, where the fulvous streaks are indistinct. Lower abdomen, vent, under tail-coverts, and under wing-coverts pale blue. Bill dusky brown; legs orange; irides red brown; eyelids yellow.

Length.—13·5 inches, wing 7·25, tail 5, bill at front 1·12, tarsus 1.

Hab.—The whole of India and Ceylon; the Himalayas, Nepaul, N. W. Provinces, the Punjab, Sind, S. Persia (Bushire), Beloochistan, Kutch, Kattiawar, Jodhpore, Jeypore, North Guzerat, the Concans and the Deccan.

In Sind it is a resident and breeds in holes of decayed trees, and sometimes in the deep forks of acacia trees in April and May. Eggs two in number, round, pure white.

Coracias garrula, *Lin.*; *P. E.* 486; *Naum. vogt.* t. 60; *Gould. B. Eur.* pl. 60; *Jerd. B. Ind.* p. 218, No. 125; *Str. F.* vol. i. 168; iv. 133; v. 502; *Murray, Hdbk., Zool., &c., Sind*, p. 128.—The European Roller.

Forehead whitish; head, neck and nape pale iridescent bluish green; chin greyish white; throat bright bluish green with pale blue shaft-streaks; breast, abdomen, vent and lower tail-coverts pale bluish green. Upper back, scapulars and tertiaries chestnut bay. Shoulders and lesser coverts violet blue, as also are the lower back and rump. Upper tail-coverts light blue. Primaries bluish black, the outer web of the first two tinged with green, the next four light blue at the base on their outer webs. Secondaries bluish black, the basal half of the feathers light blue; greater coverts pale blue. Tail, with the two centre feathers, deep greyish green or ashy blue, the others dark greenish blue for two-thirds their length on their outer webs, dusky on their inner webs, and broadly tipped with light blue, the two outermost feathers, with a spot of blackish blue at their tips; all the feathers black shafted. Bill yellowish brown, darker at the tip; irides red brown; feet yellow brown.

Length.—13 inches, wing 7·75, tail 5, bill at front 1·37.

Hab.—Central and South Europe, Madagascar, Egypt, Arabia, Persia, N. E. Africa, Western and Central Asia. In Persia, Afghanistan, and Turkistan it is said to breed. In Beloochistan, Punjab, N. W. Provinces and Sind it occurs as a migrant.

Family, ALCEDINIDÆ,—Kingfishers.

Bill long, straight and sharp; wings long and rounded; tarsi short.

Sub-Family, HALCYONINÆ.

Bill broad at base, compressed towards tip; tip and edges straight.

Gen. **Halcyon.**—*Swainson.*

Bill long; keel of upper mandible nearly straight; of lower, angular. Nostrils hidden by plumes; third quill longest. Tarsi short, scaled transversely.

Halcyon smyrnensis, *Lin.* Halcyon fuscus, *Bodd. Pl. Enl.* 894; *Gould. B. Asia; Jerdon,* i. p. 224, No 129; *Murray, Hdbk., Zool., &c., Sind,* p. 128.—The White-breasted Kingfisher.

Whole head, neck, abdomen, under tail and lesser wing-coverts rich chestnut; scapulars, tertiaries, back, rump and upper tail-coverts, also the greater coverts and winglet blue; the scapulars and tertiaries more dull; median wing-coverts black; quills blue, broadly tipped with black, with a broad oblique bar of white on the inner webs of the primaries; chin, throat, neck in front and breast white. Tail blue, the margins of their inner webs dusky brown, except the centre feathers, which are wholly greenish blue. Bill coral red; feet vermillion red; eyes brown.

Length.—10·5 inches, wing 4·5 to 4·75, tail 3, bill at front 2·25.

Hab.—The Peninsula of India and Ceylon to the base of the Himalayas, extending to Singapoor and China. Recorded from the Concans and Deccan, Kutch, Kattiawar, Jodhpore, Sambur, N. Guzerat, Travancore and Nepaul. In Sind it is a resident, breeding from April to July.

Sub-Family, ALCEDININÆ.

Bill long and slender; keel of both mandibles sloping to the tip.

Gen. **Alcedo**.—*Linn.*

Nostrils oblique; 2nd and 3rd quills longest; outer toe united to middle nearly to the tip; hind toe short and broad.

Alcedo bengalensis, *Gmel. S. N.* i. p. 206; *Edw. B.* pl. ii.; *Gould. B. Asia*; *Jerd. B. Ind.* i. p. 230, No. 134; *Hume, Str. F.* i. pp. 168-169; *Murray, Hdbk., Zool., &c., Sind*, p. 128. Alcedo ispidioides, *Less. Compl. Buff.* ix. p. 345.—The Common Indian Kingfisher.

Above, the head and hind neck are dusky, each feather tipped with pale blue. A rufous band from the nostrils to the ear-coverts. A dark patch at the gape on both upper and lower mandibles. Sides of the neck, chin and throat white; a streak of dusky feathers edged with blue from each corner of the lower mandible dividing the white of the chin and throat and sides of the neck. Quills dusky on their inner webs; the outer webs dull green blue. Scapulars dull bluish green; back, rump and upper tail-coverts pale blue; tail blue, tinged with greenish. Breast and entire under surface orange brown or ferruginous. Bill blackish above, horny brown below; irides dark brown; legs orange red.

Length.—6·5 to 7 inches, wing 2·75, tail 1·1, bill at front 1·4.

Hab.—Throughout India; also Ceylon and China. Occurs also in Beloochistan and S. Afghanistan, but is rare. In Kutch, Kattiawar, N. Guzerat, Concan and Deccan it is the common form where *A. ispida* does not occur. In Sind it appears to be a seasonal visitant.

Alcedo ispida, *Lin. S. N.* i. p. 207; *P. E.* 77; *Naum. vogt.* t. 144; *Gould. B. Eur.*; *Hume, Str. F.* i. p. 168; *Murray, Hdbk., Zool., &c., Sind*, p. 129.—The European Kingfisher.

A broad bright orange stripe from the bill to the ear-coverts margined on the side of the gape and crossed below the eye by a narrow black streak. Sides of neck with a white patch commencing from behind the ear-coverts; chin and throat white. Head, nape, neck behind, a broad streak from the base of the lower mandible and lesser wing-coverts greenish blue, the feathers edged with bright light blue, and forming narrow bars or spots of that colour; scapulars and exterior webs of the primaries greenish blue, the inner webs of the latter dusky brown. Back, rump, and upper tail-coverts rich azure blue. Tail deep blue; breast and entire under surface of the body bright orange. Upper mandible dusky brown or blackish brown, reddish at base; lower mandible reddish orange; irides hazel.

Length.—6·8 to 7·5 inches, expanse 10·5 to 11, wing 2·95 to 3, bill 1·6 to 1·7.

Hab.—Europe generally; found also in S. Afghanistan, Beloochistan and Persia. In Sind it is a resident and breeds from March to May.

Gen. **Ceryle.**—*Boie.*

Bill long and strong; keel encroaching on forehead; edges wider at base; tarsi short.

Ceryle rudis, *Linn.*; *P. E.* 62,716; *Jerd. B. Ind.* i. p. 232; *Hume, Str. F.* i. p. 170; *Murray, Hdbk., Zool., &c., Sind,* p. 129. Ispida bitorquata, *Sw. Class B.* i. p. 336. Ispida bicincta, *Sw. B. W. Africa,* ii. p. 95.—The Pied Kingfisher.

Head, hind neck, and a broad streak behind the eye extending down the sides of neck, black, finely streaked with white; supercilium white; chin, throat, sides of the neck, and upper breast white; the latter with a few of the feathers tipped black in some specimens; lower parts white, with a broad band of black, and a narrower one also, in males, across the lower breast, and in some specimens a few dark spots on the abdomen and flanks; primaries black; edge of the outer web of the first primary and the bases of the others white, forming a conspicuous white band; primary coverts black; back, rump, upper tail-coverts and scapulars black, tipped broadly with white; tail black, the feathers basally and at the tips white; bill black; legs dusky brown; irides dark brown.

Length.—10·5 to 11 inches, wing 5·5, tail 3, bill at front 2·3.

Hab.—S. E. Europe, N. E. Africa, Western Asia, Burmah and Malayana. Found all over India to Nepaul. In Sind it is a resident and breeds in holes along the banks of the Indus and canals from March to May. Eggs 2—4 in number, oval, white.

ORDER, SCANSORES

Toes arranged two in front, and two behind.

Family, PSITTACIDÆ.

Bill large and powerful, much arched, with the tip elongated, and the base with a cere, in which are the nostrils; wings and tail usually long.

Gen. **Palæornis.**

Bill large; under mandible small; cere narrow; 2nd quill of wing longest; two middle feathers of tail very long and slender; culmen rounded, toothed.

Palæornis torquatus, *Bodd. P. E.* 551; *Hahn. Atl.* t. 6; *Jerd. B. Ind.* i. p. 237; *Hume, Str. F.* ii. p. 13; *Murray, Hdbk., Zool., &c, Sind,* p. 130.; *Var. flava, Lear. Parr.* pl. 33; *Bourj. Per.* t. 2. *Totha, Poput,* Hind.; Sind.—The Rose-ringed Parroquet.

Adult Male.—Head and face emerald green; a dark line from the nostrils to the front of the eye, indistinct round the base of the narrow cere; hind neck and nape glaucous or light ashy, succeeded on the sides of the neck by a black demicollar meeting under the chin and followed by another of a peach-rose colour; back, scapulars, and tertiaries dull green; upper tail-coverts emerald green; entire under surface pale green, yellowish towards the vent; primaries, their coverts, and secondaries, dark green, their inner webs and under surface dusky;

tail feathers dark green, their inner webs and under surface yellowish; the two centre feathers dark green at their base, bluish for the remaining two-thirds, and tipped yellowish; all black shafted; under wing-coverts greenish yellow. The female is entirely green, and wants the rose collar; bill coral red; irides pale yellow; feet cinereous.

Length.—15·5 to 16·5 inches, wing 6·5 to 7, tail 9·5, bill at gape 1.

Hab.—Throughout India, part of Burmah, Ceylon, Punjab and Sind; extends to the lower Himalayas, Upper Pegu, and Nepaul. Occurs abundantly in the Concan and Deccan, Kutch, Kattiawar, Jodhpore, and N. Guzerat. Breeds throughout India in colonies. Eggs pure white, 4 in number.

Family, PICIDÆ,—Woodpeckers.

Bill long, straight, sharp and compressed at the tip.

Sub-Family, PICINÆ,—*G. R. Gr.*

Bill truncated at tip; sides of upper mandible with a distinct ridge.

Gen. Picus.—*L. et Brehm.*

Height and breadth of bill equal; nostrils hidden by bristles; fourth quill of wing longest; tail long, rounded.

Picus scindianus, *Gould.*; *Horsf. and Moore, Cat. Mus. E. I. C.* ii. p. 671; *Jerd. B. of India*, i. p. 273, No. 158; *Hume, Ibis*, 1870, p. 529; *Jerd. Ibis.* 1872, p. 7; *Hume, Str. F.* i. p. 170; *Lahore to Yarkand*, pl. ii.; *Murray, Hdbk., Zool., &c., Sind*, p. 130.—The Sind Pied Woodpecker.

Adult Male.—Forehead, lores, sides of the head, ear-coverts, supercilia and breast white, tinged buffy on the forehead, or a soiled white; a very narrow dark line above the supercilia; a dark stripe from the lower mandible extending down each side of the throat, projecting to the lower side of the breast, and joining the back at the shoulder; crown of the head mixed crimson and black; back, rump, upper tail-coverts and centre tail feathers glossy black, with a dusky tinge; scapulars and the adjacent wing-coverts white, the remainder of the wing-coverts black with a few white spots; quills brownish black, spotted with white on both webs forming white wing bars, of which there are four on the primaries and three on the secondaries; lateral tail feathers black, barred and tipped with white; lower parts white, with a few dusky streaks on the flanks and abdomen; middle of abdomen and lower tail-coverts crimson; bill blackish above, bluish grey below, 1·25 inch long; legs dusky; irides dull crimson.

Length.—8·5 to 8·75 inches, wing 4·9 to 5, tail 3. The *Adult Female* has the crown black and is smaller than the male.

Hab.—Sind, Beloochistan, South Afghanistan, Punjab, in the Salt Range, at Attock, Rawulpindee, Peshawur, and Cashmere. In Sind it is a resident and breeds in April.

Picus mahrattensis, *Lath.*; *Malh.* t. 28.1.2; *Gould. C. B.* pl. 51; *Gray, Ill. Ind. Zool.* t. 32.2; *Jerd. B. Ind.* i. p. 274, No. 160; *Hume, Str. F.* iii. 58; *Murray, Hdbk., Zool., &c., Sind*, p. 130. Picus Blanfordi, *Blyth, J. A. S. B.* 1863, p. 75.—THE YELLOW-FRONTED WOODPECKER.

Forehead and crown of head pale yellow; occiput crimson in the male, yellow in the female; lores, ear-coverts, round the eyes, sides of neck, chin, throat and upper breast white; a dusky line from the nape extending to the sides of the breast; back, wings, and tail black, banded with white; lower breast and abdomen brown, with pale edges to the feathers; centre of abdomen and vent crimson; under tail-coverts whitish, marginally streaked dusky brown; bill bluish plumbeous, dark on the culmen and tip of both mandibles; eyelids dark brown; irides deep red; legs and feet plumbeous.

Length.—7·5 to 7·75, wing 4 to 4·5, tail 2·5, bill at front 1·1.

Hab.—Throughout India and Ceylon. Occurs in Sind, Punjab, N. W. Provinces, Kutch, Kattiawar, Rajputana, (Jodhpore and Sambhur Lake), North Guzerat and the Deccan. Has also been recorded from North Pegu. Although nothing is on record of its nidification in Sind, it is not improbable that it breeds in June and July, as young birds not fully fledged have been collected in September.

Gen. **Brachypternus**.—*Strickl.*

Bill distinctly curved; lateral ridge absent; nostrils apert; tail cuneate.

Brachypternus aurantias, *Linn.*; *Malherbe pic.* t. 69. 5.6; *Blyth, Cat.* 252. Brachylophus bengalensis, *L. apud Jerd. Cat.* 212 (in part). Brachypternus dilutus, *Blyth, J. A. S. B.* xiv. 550; *Jerd. B. Ind.* p. 295, Nos. 180 and 182; *Str. F.* i. 171; *Murray, Hdbk., Zool., &c., Sind.*—THE GOLDEN-BACKED WOODPECKER.

Adult Male.—Head and crest bright crimson; hind neck, lower back, upper tail-coverts and tail black; middle of the back black, mixed with greenish yellow; upper back and scapulars rich golden yellow; wing-coverts black, changing to greenish yellow, the feathers white spotted; primaries dusky brown, spotted white on their outer and inner webs; the secondaries and tertiaries greenish yellow on their outer webs, dusky on their inner webs, and also spotted white. Cheeks, sides of the neck, and a stripe from the nostrils to the eyes, white; a dusky stripe through the eyes, to, and including, the ear-coverts; chin, throat, sides of the face below the white cheek patch, neck and entire under parts striated black and white, the striations less distinct on the lower abdomen, vent and under tail-coverts. Flanks and tibial plumes white, the feathers with black bars. The female has the head black with small white spots on the crown, and a small tuft of crimson behind; bill black; irides reddish brown; feet dusky green.

Length.—10·5 to 12 inches, wing 5·5 to 5·75, tail 4, bill at front 1·25.

Hab.—Throughout the greater part of India to the foot of the Himalayas, Cashmere, Nepaul and Ceylon. Occurs also in the Punjab, N. W. Provinces, Kelat and Afghanistan. Breeds in Sind during April and May. I agree with Mr. Hume, who very properly points out, (*Str. F.* vol. i. p. 171) that the Sind species, *B. dilutus*, is not specifically separable.

Sub-Family, YUNGINÆ,—Wrynecks.

Bill short, straight and pointed; nostrils partly hidden by membrane, apert; wings pointed; 3rd quill longest; tarsi short, scaled, and partially feathered; two front toes united at base.

Gen. **Yunx**.—*Linn.*

Characters, those of the Sub-Family.

Yunx torquilla, *Linn. P. E.* 698; *Naum. vogt.* t. 138; *Gould. B. Eur.* pl. 233; *Malh. pic.* t. 121-2; *Jerd. B. Ind.* i. p. 303, No. 188; *Hume, Str. F.* i. 173; *Blyth, Cat.* 311; *Murray, Hdbk., Zool., &c., Sind*, p. 131.—The Common Wryneck.

Top of the head greyish brown, finely barred with dark brown and white; neck, back, rump and upper tail-coverts grey, speckled with brown; from the hind head (occiput) down the middle of the back of the neck, back, and between the scapulars, is a streak of dark brown mixed with black; the wings brown, speckled with light yellow brown and a few fulvous spots; the primaries barred with pale yellow and deep brown; the tertials with mesial dark streaks and fulvous barrings; rump and tail speckled grey, the former with dark longitudinal streaks, and the latter with four irregular transverse bars of black; chin, throat, ear-coverts and neck in front, pale yellow-brown with narrow transverse black lines; breast, belly, flanks and under tail-coverts dull white, or fulvous white, barred with black; under surface of tail feathers pale greyish brown, mottled and barred with dark brown; bill horny brown; irides crimson; legs greenish, horny.

Length.—7 to 7·5 inches; wing 3·5, tail 2·5, bill at front 0·5.

Hab.—Throughout India. Occurs also in Europe and Greece; found in Beloochistan, S. Persia and S. Afghanistan, as well as in Sind, the Punjab, N. W. Provinces, Bengal, Central and Southern India, and in the Western Presidency. It is recorded from the Concan, Deccan, Kutch, Kattiawar and Jodhpore. Jerdon states he has never heard of its occurrence on the Malabar Coast, and records it from the sub-Himalayan region and Assam. In Sind it is a winter visitant.

Family, MEGALAIMIDÆ,—Barbets.

Bill stout, inflated at the sides, wide at the base, rather compressed towards the tip; base of upper mandible with stiff bristles; toes two in front and two behind.

Gen. **Xantholæma**.—*Bonap.*

Bill short and wide; 2nd quill longest.

Xantholæma hæmacephala, *Mull. P. E.* 331 *et* 746·2; *Levail Barb.* t. 35; *Marshall, Capit.* pl. *Hume, Str. F.* i. p. 453; iii. p. 77. Xantholæma indicus, *Lath. Jerd. B. Ind.* i. p. 315, No. 197; *Murray, Hdbk., Zool., &c., Sind*, p. 131.—The Crimson-breasted Barbet.

Forehead and forecrown bright crimson; throat and round the eyes pale sulphur yellow; pectoral gorget glistening crimson, edged below with an arrow of rich golden yellow; moustachial streak continued round the throat above the crimson pectoral gorget, and on the crown of the head, black; back and wing-coverts green, more or less margined yellowish; primaries and secondaries greenish; the inner webs dusky brown and margined with dull white; tail greenish, tinged with blue; beneath, the abdomen, vent and under tail-coverts fulvous or greenish white, streaked with green; bill black; irides hazel; orbitar skin dull crimson; legs coral red.

Hab.—India generally; Burmah, Malayana, Ceylon, Nepaul, Tenasserim and Upper Pegu; Punjab, N. W. Provinces and Oudh. Occurs in Kutch, Kattiawar and Jodhpore, and probably in North Guzerat also. In Sind it is rare, and occurs as a visitor in September and October, affecting the acacia forests.

Family, CUCULIDÆ, *Leach.*—Cuckoos.

Bill rather slender and compressed, curved above, tip scooped; nostrils in a membranous groove; wings long; tail rounded.

Sub-Family, CUCULINÆ.

Tarsi short, feathered and scaled; bill broad, flattened at base.

Gen. **Cuculus**.—*Lin.*

3rd quill longest; two outer feathers of tail shortest; tarsi feathered below the knee; outer front toe longest, united at base to the inner toe.

Cuculus canorus, *Linn. P. E.* 811; *Naum. vogt.* t. 127-129; *Gould. B. Eu.* pl. 240; *Jerd.* i. p. 322, No. 199; *Hume, Str. F.* iv. 288; *Murray, Hdbk., Zool., &c., Sind*, p. 131.—The European Cuckoo.

Head and upper parts dark ashy, ashy, or pale blue; breast and belly white, elegantly crossed with wavy bars of black; the quills are dusky, their inner webs marked with large oval white spots; tail long, the two middle feathers black with white tips, the others dusky, with alternate spots of white on each side of the shaft; legs short, yellow; bill black, yellowish at base beneath; orbits and irides deep yellow.

Length.—14 inches, wing 8·75 to 9, tail 7, bill at front 0·75.

Hab.—Europe, N. Africa, China, Formosa, Beloochistan, Persia, S. Afghanistan, Eastern Turkistan, and India generally; Nepaul, Burmah, Ceylon, Upper Pegu, and throughout Western, Central,

and Southern India as a migrant. It arrives in Sind during August and September.

Gen. **Coccystes.**—*Goger.*

Head crested; nostrils basal, ovate; 4th quill longest; 3rd and 4th sub-equal; tail long, graduated; tarsi not plumed.

Coccystes jacobinus, *Bodd. Pl. Enl.* 872; *Levail O. A.* t. 208. Coccystes melanoleucos, *Gmel. S. N., Horsf. and Moore, Cat. B.* ii. p. 694; *Jerd. B. Ind.* i. p. 339, No. 210; *Murray, Hdbk., Zool., &c., Sind,* p. 131. Leptosomus afer, *Frankl. Proc. Zool. Soc.* 1831, p. 121. Oxylophus serratus, *Gray, Gen. B.* ii. p. 464.—The Pied-crested Cuckoo.

Entire upper surface black with a greenish gloss; chin, throat, belly, vent and under tail-coverts white or fulvescent white; bases of the primaries white, forming a conspicuous wing patch; tail feathers broadly tipped white; the two middle narrowly; shoulders white; under wing-coverts fulvescent white; bill black; legs bluish; irides red brown.

Length.—13 inches, wing 5·5 to 5·75, tail 6·75 to 7, bill at front 0·75.

Hab.—Throughout India to Nepaul. Common in Central and Southern India, Bengal, Upper Pegu and Ceylon, rare on the Malabar Coast. In Sind, Kutch, Kattiawar, Rajputana and North Guzerat it is a summer visitant (June, July); leaving its eggs to the care of *Chatarhœa caudata* in Sind, and in other places usually to *Malacocircus griseus* or *malcolmi.*

Gen. **Eudynamys.**—*Vig. and Horsf.*

Bill strong, thick, vertically deep, and hooked at tip; 4th quill longest; tarsi not plumed below the joint, flattened in front.

Eudynamys honorata, *Linn. Pl. Enl.* 294, 586; *Lev. O. A.* t. 214. Eudynamys orientalis, *Linn. Jerd. B. Ind.* i. p. 342, No. 214; *Cat. Hodgs. Coll. B. M.* p. 119; *Murray, Hdbk., Zool., &c., Sind,* p. 132.—The Indian Koel.

Male.—Entirely black with a greenish gloss; bill pale greenish; irides fine crimson; legs slaty blue.

Length.—15·5, wing 7·5, bill at front 1.

Female.—Dusky brown with a greenish tinge, spotted with white on the head, scapulars, and wing-coverts; quills, tail, and entire under parts, including the under wing and thigh-coverts, barred with white.

Length.—17 to 17·5 inches, wing 7·75 to 8, tail 8.

Hab.—Throughout India, extending to Nepaul, Ceylon, Burmah, Malayana and the Phillipines; common in the Deccan and Concan, Kutch, Guzerat and Kattiawar. In Sind it is rare, and occurs only during the rains, laying its eggs in the nest of the common crows *Corvus splendens.*

Sub-Family, CENTROPODINÆ, *Bp.*—COUCALS OR CROW PHEASANTS.

Bill strong, deep, compressed; wings rounded; tail long, graduated; tarsi long; hallux lengthened in some; tarsi scaled.

Gen. **Centropus**.—*Illiger.*

Bill well curved, high at base; claw of the hallux lengthened, nearly straight.

Centropus maximus, *Hume, Str. F.* vol. i. 454; vi. 169.—THE CROW PHEASANT.

Head, neck, lower back, upper tail-coverts and entire under parts richly empurpled black, duller towards the vent; feathers of the forehead bristly, and those on the neck and breast with spiny shafts; tail dusky black with a greenish gloss; wings deep rufous bay or dark red; bill black; irides crimson; legs black.

Length.—19 to 20 inches, wing 9 to 10, tail 10 to 10·5, bill at front 1·25.

Hab.—Sind, Punjab, N. W. Provinces and Burmah. Hume (*S. F.* vol. vi. page 170) says it is not yet possible to define accurately the limits of *rufipennis*, *maximus* and *intermedius*. *Rufipennis*, he says, appears to be a South and Central Indian species; *maximus*, Western and N.-Western continental India; and *intermedius*, Eastern continental India and the whole of Burmah.

Gen. **Taccocua**,—*Lesson.*

Bill short, of moderate length; culmen arched; commissure and gonys straight or concave; nostrils basal, longitudinal; 4th and 5th quills nearly equal and longest.

Taccocua sirkee, *Gray, Ill. Ind. Zool.* pl. 28; *Jerd. B. Ind.* i. 353, No. 220; *Str. F.* v. 219; *Murray, Hdbk., Zool., &c., Sind,* p. 132.—THE BENGAL SIRKEER.

Head, neck, sides of the face, entire upper parts, including upper tail-coverts and tail sandy brown with a slight satiny sheen; barbs of the feathers of the forehead, crown, lores and sides of the face very lax and with stiff bristly black shafts. Eye-lashes also with black bristles, which are basally white. Chin yellowish brown, the feathers black shafted; throat, sides of the neck and breast concolorous with the back, the feathers lax and black shafted; scapulars the same. Primaries and secondaries plain sandy brown on their outer webs, their inner webs slightly darker, their shafts dark brown. Secondaries and tail feathers with obsolete bars. Lower breast, abdomen, flanks, tibial plumes, under wing-coverts and vent ferruginous; under tail-coverts brown, tinged with ferruginous. Bill cherry red, the tip yellowish. Orbits purplish. Legs dusky greenish.

Length.—17 inches, wing 5·6 to 6·2, tail 9·2 to 9·5, bill from gape 1·5.

Hab.—Sind, (Jacobabad) Punjab, N. W. Provinces, Bengal, Kutch, Concan, Deccan and Central India.

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Family, NECTARINIDÆ, *Vigors.*; Promeropidæ, *Gray*,—Honey-Suckers or Sun-Birds.

Bill long, slender; nostrils at base, and covered with a scale; wings moderate; tarsi moderate; claw of hind toe long and nearly straight.

Sub-Family, NECTARININÆ (Promeropinæ).

Bill curved, base broad; nostrils small; tail long; outer toe longer than inner.

Gen. **Arachnethra.**—*Cab.*

Bill well curved and long. Plumage dark, glossy above, and with a tuft of yellow feathers in the axilla.

Cinnyris asiatica, *Lath. Ind. Orn.* i. p. 288; *Jerd. B. Ind.* i. p. 370, No. 234; *Hume, Str. F.* vi. 190; *Murray, Hdbk., Zool., &c., Sind*, p. 132. Certhia currucaria, *Linn. S. N.* i. p. 185. Arachnethra currucaria, *Cab. Mus. Hein.* p. 105. Cinnyris mahrattensis, *Sykes, P. Z. S.* 1832, p. 90. Nectarinia asiatica, *Bly. Cat. B.* p. 224. Cinnyris brevirostris, *Blf. Eastern Persia*, p. 220, pl. xiv.—The Purple-Honey-Sucker.

Summer Plumage.—Head, neck, throat, breast, and back glossy greenish purple; abdomen purplish black; tail dull black, faintly white-tipped; wings dull black; a tuft of crimson and yellow feathers on the flanks behind the axil. In the winter garb, or non-breeding plumage, the upper parts are dull olive green, beneath yellow; shoulder and stripe from chin to vent brilliant glossy violet; wings and tail dusky. The female is olive grey above, and olive yellow beneath; the breast and throat deep yellow; wings dusky; tail black; bill and legs black; irides reddish brown.

Length.—4·5 inches, wings 2·25, tail 1·5, bill at front 0·75.

Hab.—Throughout India to Ceylon, and Burmah; also Nepaul and Upper Pegu. Occurs in Beloochistan, S. Persia, Travancore, the Deccan, Kutch, Kattiawar, Jodhpore, and N. Guzerat. In Sind it is extremely common, and breeds during June and July, laying two eggs, which are greenish white, speckled and marked with a deep grey. The nest is pendulous; usually suspended from the end of the branch of a tree and composed of wool, fibres, leaves, grasses, &c., with a hole at nearly the bottom for an entrance.

Family, UPUPIDÆ, *Bp.*—Hoopoes.

Bill long, sides compressed to tip; nostrils small and at base; wings long and rounded; tail long; outer toe united to middle; hind toe long.

Sub-Family, UPUPINÆ.—*Bp.*

Bill with prominent keel, tip sharp; claw long, curved, sharp and strong.

Gen. **Upupa.**

Bill slender and curved throughout; nostrils covered with membranous scale; tarsi broadly scaled; head crested.

Upupa epops, *Linn. P. E.* 52; *Lev. Prom.* t. 22; *Naum. vogt.* t. 142; *Gould. B. Eur.* pl. 238; *Jerd. B. Ind.* i. p. 390, No. 254; *Str. F.* i. 174; iii. 90; *Murray, Hdbk., Zool., &c., Sind*, p. 133.—THE HOOPOE.

Feathers of the crest reddish buff, each feather tipped with black, some of the median ones with a narrow whitish band, below the black tip; hind neck, sides of neck, throat and breast pale rufous fawn; chin whitish; upper back dark ashy brown; lower back and scapulars barred buffy and dark brown; wing-coverts black with two white bands; under wing-coverts buffy white; primaries, secondaries and tertiaries dark brown; the 1st primary with a white spot on the inner web, and the others barred on both webs; secondaries and tertiaries with 3—4 white bands; lower abdomen buffy, with a few dark streaks; under tail-coverts white; upper tail-coverts white, terminated with black; tail black, with a white band about the middle; bill black, reddish at the base; irides red brown; legs brownish black.

Length.—12 to 12·5 inches, wing 5·5, tail 4, bill at front 1·75 or a little more.

Hab.—Europe, India, Assam, Himalayas, Cashmere, Palestine, Persia, Beloochistan, Afghanistan, Eastern Turkistan, Sind, Punjab, N. W. Provinces, Bengal, Southern, Northern, Central, Eastern and Western India generally. Breeds in the Punjab and N. W. Provinces.

Tribe, DENTIROSTRES.

Upper mandible of bill toothed or notched near the tip.

Family, LANIADÆ,—SHRIKES.

Bill long, strong, straight, mostly hooked; keel curved, sides compressed to tip; wings moderate; tail long; tarsi strong; hind toe long; claws long, curved and sharp.

Sub-Family, LANIINÆ.

Bill moderate; nostrils lateral and rounded; wings rather long; outer toe longer than inner, and united to middle at base; hind toe long, broadly padded.

Gen. **Lanius**,—*Lin.*; Collurio, *Gray*.

Bill broad, a few short bristles at base by which the nostrils are partially covered, tip hooked; 4th quill longest; tail graduated.

Lanius lahtora, *Sykes*; *Gray, Ill. Ind. Zool.*, pl. 32,2 and 33,3; *Jerd. B. Ind.* i. 400, No. 256; *Murray, Hdbk., Zool., &c., Sind.* p. 133. Lanius burra, *Gray, Ill. Ind. Zool.* pl. 32, fig. 3.—THE INDIAN GREY SHRIKE.

A narrow frontal streak (not always distinct) continued through the eyes, including the ear-coverts to the nape, black; head, back and upper tail-coverts blue grey; primaries dusky, the feathers with a broad band of white at their bases on both webs; secondaries dusky, their inner webs broadly margined, and the tips edged with white; tertiaries and wing-coverts black; the tertiaries broadly tipped

with white, some of the feathers also margined broadly on their inner webs with the same colour; scapulars white; entire under surface white; middle feathers of the tail black, tipped white, the external feathers wholly white, black shafted, the two next following margined on their outer web and also tipped white; under wing-coverts white; bill black; legs brown black; irides hazel brown.

Length.—9·5 to 10 inches, wing 4·25, tail 4·5 to 5, bill at front 0·62.

Hab.—India generally, Sind, Beloochistan, Southern Persia, Afghanistan, Punjab, N. W. Provinces, Bengal, Deccan, Concan, Kutch, Kattiawar, Jodhpore (Rajputana generally), North Guzerat and Khandeish. Breeds in Sind in June and July. Eggs 2—4, white, with specklings of brick red or reddish brown.

Lanius erythronotous, *Vigors. P. Z. S.* 1831; *Gould. Birds Cent. Him.* pl. 12,2; *Jerd. B. Ind.* i. 402, No. 257; *Str. F.* i. 174; vii. 374; *Murray, Hdbk., Zool., &c., Sind* p. 134. Lanius superciliosus, *Sw. C. of B.* f. 200.—The Rufous-backed Shrike.

A black frontal band continued through the eyes to the back of the ear-coverts; head, neck and upper back pale ashy grey; lower back, rump, upper tail-coverts, lower scapulars, flanks, lower abdomen and vent rufous, lighter on the vent; chin, throat and upper breast white, in some a buffy tinge; primaries dusky, a small white spot at the base, and the edge of the wing white; secondaries dusky, faintly margined whitish on the external webs in some specimens, in others absent; tertiaries and wing-coverts dark brown or blackish, edged and margined on the external web with whitish; tail, the central feathers black or dark brown, lateral feathers greyish brown, edged and tipped whitish; bill and legs dark brown; irides dark brown.

Length.—9·75 to 10 inches, wing 3·5 to 3·75, tail 4·5 to 5.

Hab.—India generally and Ceylon. Beloochistan (Quetta), S. Afghanistan, Kutch, Kattiawar, Jodhpore, N. Guzerat. In Sind it is a permanent resident, and breeds during March.

Lanius vittatus, *Valenc. Dict. Sc. Nat.* 1826, xl. p. 227; *Walden, Ibis.* 1867, p. 220. Collurio Hardwickii, *Vig. P. Z. S.* 1831, p. 42. Lanius Hardwickii, *Jerd. B. Ind.* i. p. 405, No. 260; *Murray, Hdbk., Zool., &c., Sind,* p. 134.—The Bay-backed Shrike.

A broad black frontal band continued through the eyes to the nape; top of head whitish; back of head, hind neck, lower back and upper tail-coverts greyish white, paler on the rump and upper tail-coverts; middle of back and scapulars chestnut bay; primaries, secondaries, tertiaries, wing-coverts, and four central tail feathers black, the primaries with a broad white patch on both webs; outermost tail feathers on each side, and the bases and tips of the three next following white; entire under surface white or buffy white, tinged with ferruginous on the flanks, breast and abdomen; bill and legs black; irides hazel.

Length.—7·5 to 8 inches, wing 3·25, tail 4, bill at front nearly 0·75, tarsus 0·75.

Hab.—India generally; not on the Malabar Coast and Bengal (*Jerd.*) Occurs in Beloochistan, South Afghanistan, Mooltan, in the Punjab, throughout the Concan and Deccan, Kutch, Kattiawar, Jodhpore and North Guzerat. A permanent resident in Sind. Breeds from April to August, and like those of the preceding species of the genus, the eggs are white, speckled all over, or near the larger end with rusty.

Lanius cristatus, *Linn.*; *Edw. B.* pl. 54; *Cat. Hodgs. Coll. B. M.* p. 100; *Jerd. B. Ind.* i. 406, No. 261; *Str. F.* vii. pp. 269-270; *Murray, Hdbk., Zool. &c., Sind*, p. 134. Lanius phœnicurus, *Pall. Walden, Ibis.* 1867, pl. 5, fig. 2. Enneoctonus cristatus, *Pr. B. Consp. Av.* p. 362.—The Brown Shrike.

A broad band from the lores through the eyes to the ear-coverts, dusky brown; head, tail, and upper tail-coverts, rufous; back rufous brown; streak over the eye white; throat white; rest of under surface fulvous; wings dusky; the tertiaries margined rufous brown; tail rufous brown. The young birds and females have the feathers of the head, wings, and lower parts edged with brown and whitish; bill horny above, below pinkish white; irides brown.

Length.—8·10 inches, wing 3·50, tail 3·92, bill at front 0·50.

Hab.—India and Ceylon, Upper Pegu, Malacca, Penang, Bengal, and the Malay Peninsula generally; found in Sind, Kutch, Kattiawar and Jodhpore, as a visitant in the course of its migration during September and October.

Lanius isabellinus, *Hemp. and Ehr. Symb. Phys.* 1828, *Aves.* fol. e; *Strickland, P. Z. S.* 1850, p. 217; *Walden, Ibis.* 1867, p. 224, pl. v. fig. i. Lanius arenarius, *Bly. J. A. S. B.* 1846, xv. p. 304; *Jerd. B. Ind.* i. p. 407, No. 262; *Ibis.* 1872, p. 115; *Walden, Ibis.* 1867, p. 223; *Henderson and Hume, Lahore to Yarkand*, p. 183, pl. iii.; *Hume, Str. F.* i. 174; ii. 331, vii. 210—270; *Murray, Hdbk., Zool., &c., Sind*, p. 136.—The Desert Shrike.

Head and back of the neck bright rufous, seasonally duller; eye-streak black or brownish; a narrow white superciliary stripe; lores whitish; wings pale brown; the primaries narrowly edged, and the coverts and secondaries broadly with rufescent; beneath white, in some specimens, the young birds especially, rufous white with crescentic marks; upper-tail coverts and tail brown with a rufous tinge in some, the central tail feathers marked with irregular dusky bands; under tail-coverts white; bill dark brown; legs dusky.

Length.—7·75 inches, wing 3·75, tail 3·5.

Hab.—Sind, Punjab, Beloochistan, S. Persia, Afghanistan, Arabia, Khordafân, Turkistan, Abyssinia. In Sind it is common as a winter visitant only.

Sub-Family, MALACONOTINÆ, *Cab.*—Wood-Shrikes.

Bill more lengthened and less compressed than in *Lanius*; wings, tail and tarsus shorter.

Gen. **Tephrodornis.**—*Sw.*

Bill moderately hooked at tip and notched; nostrils at base hidden by bristles.

Tephrodornis pondiceriana, *Gmel. S. N.* i. p. 939; *Bly. J. A. S. B.* 1846, p. 305; *Jerd. B. Ind.* p. 410, No. 265; *Hume, Str. F.* i. 435; *Murray, Hdbk., Zool., &c., Sind,* p. 134. Tephrodornis indica, *Cat. Hodgs. Coll. B. M.* p. 90. Tentheca leucura, *Hodgs. Ind. Rev.* i. p. 447.—The Common Wood-Shrike.

Head, hind neck, scapulars, back and rump ashy brown; the feathers of the rump edged white; superciliary streak fulvous white; a dark brown streak from the nostrils to the ear-coverts; upper tail-coverts dark brown; wings dusky brown; tail dark brown, with the two outer feathers white, and margined dusky on the outer web at the tip, basally dark brown; chin and throat white; breast and upper abdomen greyish brown; lower abdomen, vent and under tail-coverts white; bill dusky horny; legs plumbeous; irides greenish yellow.

Length.—6·5 to 7 inches, wing 3·5, tail 2·75, bill at front 0·62.

Hab.—India generally, Burmah, Assam, Bengal, extending to the foot of the Himalayas. Occurs in the Deccan, North Guzerat, Kutch and Kattiawar. In Sind it is a seasonal visitant, arriving in April, breeding and leaving the Province early in September. I obtained nestlings in May and June, and during July and August, of the eight specimens collected five were young birds. None were seen in September. Its presence is easily known by a very pretty, unmistakable little song, quite unlike that of any of the *Laniinæ*.

Sub-Family, CAMPEPHAGINÆ.

Bill short, a few bristles at base; nostrils rounded; wings moderate; 3rd to 5th quill longest; tarsi transversely scaled.

Gen. **Hypocolius.**—*Bp.*

Bill hooked at tip, and notched; 3rd quill longest; feet scutellated; tail long, subcuneate.

Hypocolius ampelinus, *Bonap. Consp.* i. p. 336 (1850); *Hume, Str. F.* iii. 358; v. 349; *Murray, Hdbk., Zool., &c., Sind,* p. 135. Ceblypyris isabellina, *Heugl. Syst. Uebers. Vog. N. O. Africa; Sitzungsber. K. Akad. Wien.* xix. p. 284, No. 308; *Ibis.* 1868, pp. 181, 182, pl. v.

Upper parts generally ashy grey, with a slight rufous tinge on the head, which is more marked on the frontal portion where the feathers are rather lighter and more isabelline in tint; feathers above the nostrils, lower parts of the lores, all round the eye, and a band round the nape black, so that there is a black ring all round the head, except in the centre of the forehead; ear-coverts dark silver grey, looking black in some lights in the preserved skin; primary quills black, with rather long white tips, the tip on the first long primary being wholly, and on the second partially, dusky; outer secondaries black with grey

edges, the black diminishing in amount, until it disappears completely on the feathers near the body; tail feathers all the same colour as the back with black tips about three-quarters of an inch long; chin and throat isabelline; breast grey, like the back; abdomen and lower tail coverts pinkish isabelline; under wing-coverts light grey; legs flesh coloured; bill horn coloured, dusky towards the tip.

Length.—Before skinning 10·25 inches, wing 4·2, tail (from insertion of central feathers) 4·75, tarsus 1, midtoe and claw 0·95, wing short of end of tail 3·6, culmen (point of bill from rise of skull) 0·85, bill from front 0·58, from gape 0·9.

The female is described by Heuglin as slightly smaller, isabelline grey in colour, with an olivaceous tinge, darker above than below, wanting altogether the black marking on the head, and having much less distinct black tips to the tail feathers. The ends of the primary quill feathers, the two first excepted, blackish with white margins.—*Blf. Str. F.* iii. p. 358.

Hab.—Abyssinia, Bushire (Persian Gulf) and Nal in Khelat. Rare in Sind. A single specimen was obtained by Mr. Blanford on the lower hills, on the eastern flank of the great Kirthur Range, which forms the boundary between Sind and Khelat.

Gen. **Graucalus**.—*Cuv.*

Bill strong, deep, wide at base; culmen curved and hooked; a few rictal bristles; wings long and pointed; tarsus moderate; claws well curved.

Graucalus macii, *Lesson, Traité*, p. 349; *Blyth, Cat. Mus. A. S. B.* p. 190; *Bp. Consp.* i. p. 354; *Jerd. B. Ind.* p. 417, No. 270; *Ball, Str. F.* 1873, p. 65; *Hume, op. cit.* 1874, p. 204; *Murray, Hdbk., Zool., &c., Sind*, p. 136; *Hume, Str. F.* 1877, p. 29. Ceblypyris papuensis, *Jerd. Madr. Journ.* x. p. 242. Graucalus Layardi, *Blyth, Ibis.* 1866, p. 368; *Jerd. Ibis.* 1872, p. 117.—The Large Cuckoo-Shrike.

Head, neck, back, rump, upper tail-coverts and scapulars french-grey; primaries and their coverts black, externally edged with whitish; secondaries french-grey on the outer webs, and margined and tipped whitish; the inner webs dusky; tail with the two centre feathers grey, tipped with white; the rest black, broadly tipped with white. A narrow frontal line, lores, below the eye, and at the gape black. Sides of face, and ear-coverts darkish grey beneath; the neck and breast french-grey; upper abdomen lighter, with numerous dull white transverse lines; lower abdomen, vent, and under tail-coverts white; under wing-coverts and axillaries white with a few cross lines of grey at the edge of the wings; bill blackish; irides rich lake; legs plumbeous.

Length.—11·8 to 12 inches, wings 6·5 to 7, tail 5 to 6, tarsus 1 to 1·05, bill at front 1.

Hab.—India generally and Ceylon, extending to Nepaul and the Burmese countries. Abundant in Southern India, and occurs in Upper

Pegu, Assam, Port Blair; also the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Kattiawar, Jodhpore, North Guzerat, and Travancore. In Sind it is uncommon.

Gen. **Pericrocotus**.—*Boie.*

Bill short, rather broad at base and high; culmen slightly curved; wings long, 4th and 5th quills longest; tail long, lateral feathers graduated; tarsi and feet short and feeble.

Pericrocotus peregrinus, *Linn. S. N.* i. p. 342; *Gray, Gen. Birds*, i. p. 282; *Bp. Consp. B.* i. p. 356; *Jerd. B. Ind.* i. p. 423, No. 276; *Hume, Str. F.* 1873, p. 177; 1874, p. 209; 1875, p. 96; *Sharpe, Str. F.* 1876, p. 209.—The Small Minivet.

Upper surface of body ashy grey; a narrow frontal band, lores, chin, throat and ear-coverts blackish; wing-coverts black, the lesser series edged with dull grey, and the greater with a narrow orange tip; quills dusky black, duller toward the tips; the bases of the primaries, except the first three, orange red, forming a conspicuous wing patch; rump and upper tail-coverts bright vermillion; tail black, the outer four feathers on each side widely tipped with orange; the breast vermillion, also the upper abdomen, and flanks, fading on the lower abdomen, vent and under tail-coverts to yellowish; under wing-coverts and edge of the wing yellow; thigh-coverts dusky black; bill and legs black; irides brown.

Length.—6 inches, wing 2·55, tail 3, bill at front 0·45.

The female is light grey above, the throat white, also the eye streak; sides of forehead and lower parts whitish, tinged with yellow on the breast, abdomen, and under tail-coverts; the flanks and under wing-coverts brighter yellow; quills light brown; the primaries with narrow white edgings; the wing spot yellow; rump vermillion; colour of bill and legs as in the male; *length*, 6· 25, wing 2·75, bill 0·45, tail 3·1.

Hab.—India, Ceylon, Burmese countries, Andamans and Java. Occurs in the N. W. Himalayas, South and Central India, Nepaul, the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Deccan, Kutch, Kattiawar, Jodhpore, and N. Guzerat. In Sind it is a winter visitant, arriving in August and remaining till about the end of December.

Pericrocotus brevirostris, *Vigors. P. Z. S.* 1831, p. 43; *Gray, Gen. B* i. p. 282; *Bp. Consp.* i. 357; *Jerd. B. Ind.* i. p. 421, No. 273; *Henders. and Hume, Lahore to Yarkand*, p. 184; *Sharpe, Str. F.* 1876, p. 209; *Hume, Str. F.* 1877, p. 187; *Sharpe, Cat. Passerif. B. M.* p. 79; *Murray, Hdbk., Zool., &c., Sind*, p. 137. Phœnicornis brevirostris, *Gould. Cent. Him. B.* pl. 8.—The Short-billed Minivet.

Head, nape, upper back, wings and middle tail feathers glossy blue-black; the lower back, rump and upper tail-coverts deep crimson; lateral tail feathers crimson, the bases black; wing-coverts glossy black; the greater coverts crimson, their bases black; wing spot crimson; chin, throat, and sides of face blue-black, rest of under surface crimson; wing-coverts crimson, the greater series ashy black. The female has the head and back grey, the forehead tinged with yellow, the lower back, rump

and upper tail-coverts yellow; the tail yellow, the basal half of the feathers black; wings dusky, or black, the greater coverts tipped with yellow; wing spot yellow; forehead and lores yellowish white; chin, cheeks and feathers below the eye whitish; under surface of body yellow washed with orange on the breast; bill and legs black; irides dark brown.

Length.—7·5 to 8 inches, wing 3·45, tail 4, tarsus 0·55.

Hab.—The Himalayas, Cashmere, Bhootan, Shillong, Cachar, Assam, Chittagong, Arracan, Upper Burmah, Punjab, Bengal, Oudh, Rajputana and Central India, N. W. Provinces, visiting the Deccan, Concan, Kutch, Kattiawar and Sind during the summer months.

Family, DICRURIDÆ,—Drongo-Shrikes.

Bill stout, large, wide at base, more or less curved, and keeled at the culmen, tip notched; nostrils more or less covered with bristles, generally completely so; tail forked, of ten feathers.

Gen. Buchanga.

A crest of frontal plumes, not elongated into an erect tuft; tarsus scaled in front.

Buchanga atra, *Herm. Obs. Zool.* p. 208. Dicrurus macrocercus, *Viell. N. Dict.* ix. p. 588; *Jerd. Mad. Journ.* xiii. pt. 2, p. 121; *id. B. of Ind.* i. p. 427, No. 278; *Gray, Gen. B.* i. p. 286; *Str. F.* iv. 278; vi. 213; vii. 272; *Murray, Hdbk., Zool., &c., Sind,* p. 137. Buchanga albirictus, *Hodgs. Ind. Rev.* p. 326; *Hume, Str. F.* 1873, p. 178; *Ball. Str. F.* 1874, p. 402. Dicrurus balicassius, *Sykes, P. Z. S.* 1832, p. 86 (*nec. l.*) *Sharpe, Cat. Passerif. B. Br. Mus.* p. 246.—The Common Drongo-Shrike or King Crow.

Head, hind neck, back, upper tail-coverts, lesser and median wing-coverts glossy blue-black, a white spot at the gape; chin, throat, lores, sides of the face, and under surface of the body black, less glossy than the upper surface, and with a greenish cast; greater and primary coverts black, glossed greenish, also the secondaries and tertiaries; primaries and tail duller black; the inner webs of the primaries and under surface of the tail dusky. Young with whitish lunules on the under surface of the body. Bill and legs black; irides red.

Length.—12 inches, wing 5·75, tail 6·25 to tip of outer feather, tarsus 0·9.

Hab.—The whole of India and Ceylon to Nepaul. Occurs also in Upper Pegu, Chaman (South Afghanistan) and at Quetta in Beloochistan. Except at Quetta and Chaman, the King Crow is a resident wherever it occurs, breeding during the rains. The nest is made of twigs, cotton, rags, &c., loosely put together, with a shallow saucer-like recess for the eggs, which are of a white and sometimes a pinkish colour, spotted all over with brick red. Often nests have been found to contain besides a few typical coloured eggs, one or two pure white ones. The usual number found in each nest is four.

Family, MUSCICAPIDÆ,—Fly-Catchers.

Form very varied; bill various, curved above and notched at the tip; sides compressed to tip; tail long or moderate; tarsi short; rictal bristles numerous.

Sub-Family, MYIAGRINÆ.—*Bonap.*

Bill broad at base, hooked at tip; wings rather long; tail moderate, in *Tchitrea* (Terpsiphone) long, with the central feathers elongated in the male.

Gen. **Terpsiphone**, *Gloger. in Froriep's Notiz.* xvi. p. 278; (*Sharpe, Cat. B. M.* 345, *Passerif.*) Muscivora, *Cuv.* Tchitrea, *Less.*

Bill moderately hooked and notched, very large and broad, longer than the tarsus; tail with elongated centre tail feathers.

Terpsiphone paradisi, *Linn. Syst. Nat.* i. p. 324; *Sharpe, Cat. Passerif.* p. 347; *Cat. Mus. Heine. Th.* i. p. 58. Muscicapa paradisi, *Cuv. Regne. Anim.* 1817, i. p. 344; *Sykes, P. Z. S.* 1832, p. 84; *Jerd. Ill. Ind. Orn.* pl. 7. Tchitrea paradisi, *Less. Traité,* p. 386; *Gray, Gen. B.* i. p. 259; *Hume, Ibis.* 1869, p. 9; *Jerd. B. Ind.* p. 444, No. 288; *Str. F.* 1873, pp. 403, 474; 1875, p. 102; *Murray, Hdbk., Zool., &c.,* p. 138.—The Paradise Fly-Catcher.

Adult Male.—Head, with a long occipital crest, sides of face, neck, and entire throat glossy steel green; above and below pure white, some of the feathers more or less black shafted; quills black, externally white, the edge of the innermost quills white, with a longitudinal dark mark down the centre; tail white, with black shafts and narrow blackish edgings to the feathers; middle tail feathers elongated, 12-13 inches in length.

Adult Female.—Crown of head and crest glossy greenish black; lores, sides of face, sides of neck, and throat greyish; rest of under surface of body white; the flanks greyish, and tinged with rufous; back, wing-coverts and inner secondaries bay; tail light chestnut; bill bluish; legs and feet pale blue; irides dark brown.

Length of Male.—Including elongated tail feathers 17 inches, bill 0·85, wing 3·65, tail 5·5, middle-feathers 13. *Female, length* 7·5, wing 3·45, tail 4.

Hab.—India and Ceylon to Nepaul and Cashmere. Abundant on the Malabar Coast and in Southern India. Occurs in the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Central India, Kutch, Kattiawar, Jodhpore and N. Guzerat. In Sind it is a winter visitant arriving in September.

Gen. **Muscicapa,** *Linn.*; Butalis *Boie.*; Erythrosterna, *Bp.*

Wings pointed and long; bill rather long, depressed, wide throughout, except at tip; second primary longer than the secondaries, and nearly the length of the third; nasal bristles scanty.

Muscicapa grisola, *Linn. Syst. Nat.* i. p. 328; *Tem. Man.* i. p. 152; *Naum. vogt. Deutch.* ii. p. 216; *MacGill. Br. B.* iii. p. 518; *Gray, Gen. B.* i. p. 262; *Gould. B. Eur.* ii. pl. 65; *Sharpe, P. Z. S.*

1873, p. 71; *id. Cat. Passerif. B. Br. M.* p. 151; *Blf. East Pers.* p. 143; *Str. F.* 1813, p. 377. Butalis grisola, *Boie. Isis.* 1826, p. 973; *Cat. Mus. Heine. Th.* i. p. 52; *Sharpe, Cat. Afr. B.* p. 42, No. 391; *id. Ibis.* 1872, p. 70; *Hume, Str. F.* 1875, p. 467; 1877, p. 495. Butalis africana, *Bp. C. R.* xxxviii. p. 652.—The Spotted Grey Fly-Catcher.

Lores and feathers immediately above the nostrils dingy fulvous white; head, nape, cheeks, ear-coverts, back and scapulars, pale earthy or greyish brown; the feathers of the head with darker brown central streaks not extending to the tips, and those of the forehead tinged with the fulvous colour of the lores; the rump, in some, uniform with the back, in others slightly darker; wings and tail brown, paler and greyer on the tertiaries and laterals, all the feathers margined with brownish white; the greater secondary coverts and tertials most broadly so; the tail feathers, except the exterior lateral ones, inconspicuously so; lower parts white, tinged with fawn colour towards the vent, and with narrow inconspicuous grey brown streaks on the breast; axillaries and wing lining very pale rufous fawn; sides and flanks tinged faintly with the same colour and dull fulvous.

"Bill black, dark fleshy at base of lower mandible; legs and feet blackish brown; iris deep brown; interior of mouth orange."—(*Hume, Str. F.*, vol. 3, p. 467.)

Length.—5·4 inches, bill at front 0·55, wing 3·4, tail 2·45, tarsus 0·6.

Hab.—The whole of Europe, extending in the winter into South Africa and N. W. India, Sind, Beloochistan, Afghanistan, Persia (Northern and Southern) Kutch, Kattiawar, Jodhpore, Sambhur. Visits Sind in the course of its migration in August and September, and at about the same time of the year in other parts of the Western Presidency.

Muscicapa parva, *Bechst. Nat. Deutsch.* iv. p. 505; *Tem. Man.* i. p. 158; *Werner Atlas Insectivores*, pl. 10; *Gray, Gen. Birds*, i. p. 262; *Gould. B. Eur.* ii. pl. 64; *Dresser, Ibis.* 1876, p. 188. Erythrosterna parva, *Bp. Consp. List. B. Eur. and N. Amer.* p. 25; *id. Consp.* i. p. 318; *Blf. East. Pers.* p. 144; *Hume, Str. F.* 1873, pp. 179, 377, 405; 1875, p. 469; 1876, p. 273; 1877, p. 484; vol. v. 471; *Murray, Hdbk., Zool., &c., Sind*, p. 139. Muscicapa rufogularis, *Brehm. Vog. Deutsch.* p. 288.—The Red-breasted Fly-Catcher.

Forehead, sides of face and ear-coverts grey; a circle of whitish feathers round the eye; crown of head, back, wing-coverts and the quills externally ashy brown; inner web of primaries dusky; upper tail-coverts and tail dark brown, all, except the centre tail-feathers, white at their bases; the external web of the lateral ones on each side dusky; chin, cheeks, and foreneck orange, rest of under surface fulvous white or buffy white; thigh-coverts ashy brown; under wing-coverts fulvescent, as are also the margins of the inner webs of the under surface of the quills; bill brownish; legs dark brown.

Length.—5 inches, bill at front 0·4, wing 2·6, tail 2.

The female has the quills and wing-coverts, especially the greater series, edged with light brown; the under parts of chin, throat and breast deep buffy, and the abdomen and vent white.

Hab.—Europe, extending into N. W. India, the Himalayas and Nepaul. Extremely common in Beloochistan, Persia and South Afghanistan; also in Sind, the Punjab, N. W. Provinces, Oudh, Rajputana, Central India, the Deccan, Concan, Kutch, and North Guzerat. A winter visitant in Sind, and other parts of the Western Presidency.

Gen. **Rhipidura**, *Vig.*; Leucocirca, *Sw.*

Bill with long bristles at base; nostrils partly hidden by them; 4th and 5th quills longest; tail broad and graduated.

Rhipidura albifrontata, *Frankl. P. Z. S.* 1831, p. 116; *Blyth, J. A. S. B.* xii. p. 935; *Gray, Gen. B.* i. 258; *Sharpe, Cat. Passeriformis B. M.* p. 338. Leucocirca albofrontata, *Jerd. Madr. Journ.* xi. p. 12; *id. Ill. Ind. Orn.* pl. 2; *Jerd. B. Ind.* p. 452, No. 292; *Str. F.* iii. p. 104; *Murray, Hdbk., Zool., &c., Sind*, p. 138.—The White-browed Fantail.

Head, neck, lores, and sides of the face slaty black; a broad frontal band, extending over the eyes to the nape, white; throat white, the feathers black at their bases; lower throat black, slightly edged with white; back and wing-coverts ashy brown, the latter, including the primary coverts, tipped with triangular spots of white; axillaries dark brown, edged with whitish; breast, abdomen, under tail and thigh-coverts white, the feathers of the latter with black bases; tail dark brown, all, except the centre ones, broadly tipped white; bill and legs black; irides deep brown.

Length.—6 to 6·7 inches, bill at front 0·5, wing 3·3 to 3·15, tail 3·6, tarsus 0·75.

Hab.—India generally and Ceylon, to Burmah and Pegu and N. W. Himalayas. Common in the Punjab, N. W. Provinces, Oudh, Central India, Rajputana, Kutch, Kattiawar and Jodhpore; also in Southern India, the Concan and Deccan, especially in gardens. Breeds in Sind from March to August. The nest is a very neat cup, made of fine fibres, &c., covered on the outside and inside with cobweb, and usually attached towards the end of a low branch. Eggs two in number.

Family, TURDIDÆ.

Bill rather strong, sides slightly compressed; wings long; tail moderate; tarsi and toes various.

Sub-Family, TURDINÆ,—True Thrushes.

Bill of moderate length, as long as head; nostrils in a groove, apert; wings long and broad, somewhat pointed; 1st quill very short, 3rd and 4th longest, sub-equal; tail moderate; outer toe longer than inner, and united to middle at base.

Gen. **Monticola.**

Bill moderate or long, moderately hooked at tip; nostrils apert; rictal bristles numerous; wings long; 3rd quill longest; tarsus scutellate.

Monticola cyanus, *Linn. Syst. Nat.* i. p. 296; *Gmel. Syst. Nat.* i. p. 834; *Lath. Ind. Orn.* i. p. 345. Monticola cyana (*Linn.*) *Boie.*

Isis. 1822, p. 552; *Shelley, Birds Egypt*, p. 70; *Blf. Eastern Persia*, ii. p. 155. Petrocossyphus cyaneus (*Linn.*) *Boie. Isis.* 1828; *Jerd. B. Ind.* i. p. 511, No. 351; *Ill. Ind. Orn.* p. 20; *Hume and Henders. Lahore to Yarkand*, p. 190; *Heugl. Syst. Uebers.* p. 29; *Sharpe and Dresser, B. Eur.*; *Murray, Hdbk., Zool., &c., Sind.* Cyanocincla cyanus, (*Linn.*) *Str. F.* 1874, p. 407; vol. vi. p. 247; *id.* iii. p. 112.—THE BLUE ROCK THRUSH.

Male.—Head, neck, and back indigo blue, with a faint metallic lustre on the head; lores dusky greyish; wings, their coverts and tail dark brown; the outer webs of the feathers indigo blue; under surface of body cobalt blue; the abdomen and the under tail-coverts with faint streaks and spots of whitish.

Female.—Of a dingy brown, scarcely tinged above with indigo or cobalt blue; some of the feathers edged whitish; under parts fulvous, with dusky transverse bars, including the under tail-coverts; bill black; legs black; irides brown.

Length.—8·5 to 9 inches, wing 4·5 to 5, tail 3·75 to 4, bill at front nearly one inch.

Hab.—Southern Europe, N. Africa, Beloochistan, Persia, Afghanistan; wintering throughout the Peninsula of India. Recorded from all India, Tennaserim, Cashmere, Nepaul and N. W. Himalayas. Extremely common in the Concan and Deccan, Kutch, Kattiawar, Jodhpore, Sambhur and North Guzerat, also in South India.

Monticola cinclorhynchus, *Vig. P. Z. S.* 1831, p. 172. Petrophila cinclorhyncha (*Vig.*) *Jerd. Madr. Journ.* x. p. 252; *Hume, Nest and Eggs, Ind. B.* p. 227. Orocetes cinclorhynchus (*Vig.*) *Bp. Consp.* i. p. 297; *Jerd. B. Ind.* i. p. 515; *Sharpe*, vol. v. *Cat. Passerif. B. Museum*, p. 320; *Murray, Hdbk., Zool., &c., Sind.*, p. 140; *Str. F.* vol. iv. 398.—THE BLUE-HEADED CHAT THRUSH.

Male.—Head, nape, chin, upper throat, and cheeks indigo or cobalt blue, also the lesser wing-coverts; lores, ear-coverts, sides of neck, back, and scapulars black, tinged with dusky blue on the back; primaries, their coverts, and greater and median coverts edged with bluish on their external webs; a white bar on the outer webs of the secondaries; rump, upper tail-coverts, entire under surface, axillaries and under wing-coverts, ferruginous or chestnut; tail black, the external webs of the feathers margined with blue. In the female the colours are less pronounced; bill blackish; legs brown; irides dark brown.

Length.—7 to 7·5 inches, wing 4, tail 2·75 to 3, bill at front 1.

Hab.—The Indian Peninsula, ranging to Nepaul and Cashmere. Occurs sparingly in Sind, Punjab, and N. W. Provinces, and more abundantly in the Concan, Deccan, Travancore, North Guzerat and Rajputana, in the course of its migration. Breeds in the Himalayas.

Gen. **Merula**, *Leach.*—GROUND THRUSHES.

Bill moderate, stout, compressed, straight and notched; rictal plumes short; wings long; 3rd and 4th quill longest.

Merula unicolor, *Tick. J. A. S. B.* ii. p. 577; *Gould. P. Z. S.* 1837, p. 136; *Gray, Gen. B.* i. p. 220. Geocichla unicolor (*Tick.*) *Blyth, Cat. B. Mus. As. Soc.* p. 163; *Jerd. B. Ind.* i. p. 519, No. 356; *Murray, Hdbk., Zool., &c., Sind*, p. 140.

Above uniform dusky, slaty, or ashy grey; wings and tail dusky brown, their external webs margined with ashy grey; breast, throat and flanks pale slate grey; chin pale grey, nearly white; abdomen, vent and under tail-coverts white; under wing-coverts buff; legs and feet pale brown; bill dusky yellow; eyelids and gape yellow; irides brown.

Length.—9 inches, wings 4·5 to 4·75, tail 3·45, bill 0·95.

Female.—Upper parts olive brown; ashy grey on the rump and upper tail-coverts; throat and breast paler than in the male, nearly white; the feathers of the throat with some spots.

Hab.—Central, Southern and Western India. Common in the Punjab, N. W. Provinces, Oudh, Central India, Deccan, Rajputana and Nepaul. Breeds in the Himalayas, and migrates to the plains in winter. In Sind it is rare and is found in the northern portions only.

Merula atrigularis, *Tem. Man. d' Orn.* i. p. 169; *Gould. B. Eur.* ii. p. 75; *Blyth, Cat. B. Mus. As. Soc.* p. 161; *Sharpe, Cat. Birds B. M.* vol. v. p. 268. Turdus atrigularis (*Tem.*) *Blf. East. Pers.* ii. p. 158; *Seebohm, Ibis.* 1879, p. 6. Planesticus atrigularis (*Tem.*) *Bp. Cat. Parzud; Jerd. B. Ind.* i. p. 529, No. 365; *Hume and Henders, Lahore to Yarkand*, p. 192; *Murray, Hdbk., Zool., &c., Sind*, p. 140. Turdus mystacinus, *Severtz. Turkest. Jevotn.* pp. 64, 115, 119.—The Black-throated Thrush.

Above pale cinereous brown; the feathers of the head, wings and tail darker brown; a black streak from the base of bill to the eyes not very distinct; ear-coverts dark brown, tipped paler; chin, throat, breast and lores black; abdomen, vent and under tail-coverts white, the latter with a few brown dashes; axillaries darkish grey; under wing-coverts buffy.

The female wants the pectoral gorget; the chin and throat is white; the sides and breast grey brown, with conspicuous dark centres; bill yellow, the tip dusky; orbits yellow; legs horny brown; irides dark brown.

Length.—10·5 inches, wing 5·75, tail 4·75, bill at front 0·91.

Hab.—Beloochistan, Persia, Afghanistan, Western Turkistan, the Himalayas, Nepaul, Punjab, N. W. Provinces and Sind during winter. Breeds in Siberia and Turkistan.

Sub-Family, TIMALINÆ,—Babbling Thrushes.

Legs and feet stout and large; bill moderate, keel curved; nostrils exposed; wings short and rounded; tail graduated; tarsi long, scutate.

Gen. **Pyctorhis**.—*Hodgs.*

Bill rather short, strong and deep; rictus bristled; orbits nude; 4th and 5th quills longest.

Pyctorhis sinensis, *Gmel.*; *Jerd. B. Ind.* ii. p. 15, No. 385; *Murray, Hdbk., Zool., &c., Sind*, p. 140. Timalia horsfieldii, *Jerd. and Selby, Ill. Orn.* pl. iii. Timalia bicolor, *Lafresn, Mag. Zool.* pl. 39—THE YELLOW-EYED BABBLER.

Above reddish brown, darker on the head, and rufous on the wings; inner webs of primaries and secondaries dusky; tail dull brown, with very indistinct dusky bands, a stripe from the nostrils through the eyes; chin, throat, and entire under surface white; bill black, the base at the nostrils yellow; legs yellow; irides yellow brown; orbits orange.

Length.—6·25 to 6·5 inches, wing 2·75, tail 3·5, bill at front 0·5.

Hab.—India generally, extending to Nepaul and Burmah. Common in Bengal, N. W. Provinces, Punjab, and Sind; also in Kutch, Kattiawar, N. Guzerat, Jodhpore and the Deccan. Occurs also in Upper Pegu, Ceylon and Southern India. In Sind it is as in other parts of India a resident, and breeds in July and August. Eggs usually two, and sometimes three in number, prettily marked on a dusky or pinkish ground with streaks, spots and blotches of a brick red and brown colour. Affects chiefly the low tamarisk jungle, in which it also builds its nest.

Pyctorhis griseigularis, *Hume, Str. F.* vol. iv. p. 504; v. pp. 116, 250.—THE GREY-THROATED BABBLER.

"Forehead, upper part of lores and streak over the eyes deep reddish brown, each feather streaked with ashy grey; crown and occiput deep ferruginous; cheeks and ear-coverts paler ferruginous; sides of neck yellowish rusty; nape, back, scapulars, rump, and upper tail-coverts, bright rusty ferruginous, in some lights slightly brownish and most rusty on upper tail-coverts, almost entire visible portion of closed wing bright ferruginous chestnut, rest of feathers hair brown; tail (imperfect) moderately dark brown, feathers margined strongly on outer webs with ferruginous and most broadly so towards their bases; chin, throat and upper breast pale brownish grey or ashy; rest of lower parts dull rusty, browner and lighter on lower breast, brighter and more ferruginous on flanks and lower tail-coverts."

Length.—5·5 inches, wing 2·5, tail (imperfect) 3·4, bill from nostril straight to point 0·32, tarsus 1.

Female.—"Bill pale horny or fleshy brown, nearly white towards base of lower mandible; legs pale fleshy or orange brown, the feet darker." —*Hume, Str. F.* vol. v. p. 116.

Hab.—Sukkur, and Sehwan (Sind).

Gen. **Malacocircus.**—*Sws.*

Bill moderate, rather deep, barely hooked at tip; commissure slightly curved; nostrils lateral, apert; rictal bristles few; wings short, much rounded; 4th, 5th, and 6th quills nearly equal and longest; tail long; tarsus scutellate.

Malacocircus terricolor, *Hodgs. J. A. S. B.* 1836, 771; *Jerd. B. Ind.* ii. p. 59, No. 432; *Murray, Hdbk., Zool., &c., Sind,* p. 142. Malacocircus bengalensis, *Blyth, Cat. of B.* p. 140. Turdus canorus, *Linn. Syst. Nat.* i. p. 293; *Pr. Bp. Consp. Av.* p. 373.—THE BENGAL BABBLER.

Head and hind neck pale ashy; upper back ashy or grey brown, the feathers pale shafted; feathers of the lower back and rump greyish brown, and very lax; outer webs of primaries pale grey; inner webs dusky; tertiaries dusky, the feathers with indistinct darker cross bars; tail reddish ash or brown, the lateral feathers dusky brown, with faint bars, and the external ones tipped with whitish; chin and throat ashy, the feathers edged and shafted lighter; breast fulvous brown, also with lighter edges and shafts; abdomen, vent and under tail-coverts buffy white, paler and almost white on the under tail-coverts; bill yellowish brown; irides pale yellow; legs pale yellow.

Length.—9 to 10 inches, wing 4·25, tail 4·5, bill at front 0·75.

Hab.—India generally, extending to Nepaul. Common in the Punjab, N. W. Provinces, Oudh, Central India, Bengal, Sind, and on the Western Coast, in Kutch and Kattiawar. Recorded from Aboo, North Guzerat and Jodhpore. In Sind it is a resident, and breeds from April to July.

Malacocircus malcolmi, *Sykes; Fraser, Zool. typ.* pl. Garrulus albifrons, *Gray, Hardw. Ill. Ind. Zool.* 2. f. 1.—THE LARGE GREY BABBLER.

Forehead pale bluish, the feathers white shafted; a dusky streak from the nostrils to the eye; ear-coverts brownish grey, the feathers white shafted and lax; crown of head, hind neck and back brownish grey, with dark mesial streaks to the feathers; rump lighter; primaries edged pale grey on the outer web; the inner webs dusky brown; secondaries dusky brown; tertiaries and wing-coverts concolorous with the back, or greyer in some specimens; tail, with the central feathers, dusky brown, with numerous faint cross bars, the next two on each side lighter, and the rest fulvescent white; under surface of body fulvescent white, darker or rufescent on the chin, throat and breast; under wing-coverts silky buff; bill horny brown; legs yellowish; irides light yellow.

Length.—11 inches, wing 4·5 to 4·75, bill at front 0·75 to nearly one.

Hab.—India, Western and Southern Presidencies; does not extend beyond Sind. Usually found associated with *M. terricolor* at Larkhana and Sehwan. Rare in Lower Sind. Rather numerous in the Concan and Deccan, Kutch, Kattiawar, Jodhpore and North Guzerat.

Gen. **Chatarrhea.**—*Blyth.*

Bill rather longer, slender and more curved than in *Malacocircus.*

Chatarrhea caudata, *Dum.; Jerd. B. Ind.* ii. p. 67, No. 438; *Hume, Str. F.* vol. i. p. 180; *Murray, Hdbk., Zool., &c., Sind,* p. 142. Chatarrhea huttoni, *Blyth, J. A. S. B.* 1847, xvi. p. 476.—THE STRIATED BUSH BABBLER.

Above pale greyish brown; crown of head and hind neck dark brown, with pale edgings; back pale greyish brown, the feathers with dark mesial streaks; rump and upper tail-coverts like the back, the rump unstriped; the upper tail-coverts mesially streaked dark brown; outer webs of primaries concolorous with the back; inner webs dusky; tail feathers pale greyish brown, with dark shafts and obsolete transverse barring; ear-coverts silky, fulvous brown; under surface pale isabelline or rufescent white; chin and throat white; sides of the breast and flanks with narrow mesial streaks; irides reddish; bill horny brown, yellowish near the base; legs pale or yellowish brown.

Length.—9 to 10 inches, wing 3 to 3·5, tail 4·5 to 5, bill 0·88 to 1.

Hab.—Sind, Beloochistan, S. E. Persia, and Afghanistan; also Punjab, N. W. Provinces, Bengal, Kutch, Rajputana, Guzerat and Central India.

I have compared my series of skins of this species (37 in number) from Beloochistan (Quetta 11), Chaman (S. Afghanistan 6), Gwadur 4, and all parts of Sind 16, and cannot find that there is any special distinctive character which necessitates the making of a second species. *C. huttoni*, Blyth, and *C. caudata*, are virtually one and the same species. I have specimens from Sind (Sehwan) 10·5 inches in length, with a tail of 5 inches and a wing of 3·5.

Chatarrhea earlei, *Blyth, J. A. S. B.* xiii. 369; *Jerd. B. Ind.* ii. p. 68; *Str. F.* vol. i. 180, 420; iii. 124; *Murray, Hdbk., Zool., &c., Sind*, p. 140.—THE STRIATED REED BABBLER.

Above pale greyish brown; head and back with dark brown streaks; tail like the back, with faint traces of transverse striæ; chin, throat and breast fulvescent or reddish brown, with faint mesial streaks; abdomen, vent and under tail-coverts fulvescent white; bill dusky yellow; legs dusky brown; irides bright yellow.

Length.—9·5 to 10, wing 3·5, tail 5·5, bill at front 0·75.

Hab.—Sind, Punjab, N. W. Provinces, throughout Bengal and Nepaul, extending along the valley of Assam, and southwards to Burmah. With *C. caudata*, this species is numerous everywhere in Sind, to Afghanistan.

Laticilla, *Bly.*; Eurycercus, *Bly.*

Bill of moderate length, compressed and slender, the culmen slightly curved; wings short, rounded; 5th and 6th quills longest; tail long, graduated.

Laticilla burnesii, *Blyth, J. A. S. B.* xiii. p. 374; *id. Cat.* 786; *Hume, Str. F.* i. p. 180; *Murray, Hdbk., Zool., &c., Sind*, p. 143.—THE LONG-TAILED REED BIRD.

Above olive brown, paler on the head, rufescent on the back and sides of the neck; the feathers including the scapulars mesially streaked with dark brown; rump and upper tail-coverts unstriped; lores and round the eye white; ear-coverts greyish white; tail olive brown,

with faint transverse striæ, the lateral feathers narrowly margined at the tips with whitish; a double line of dark spots from the base of the lower mandible on either side of the throat; under surface white; the flanks and sides brownish, the feathers with fulvous mesial streaks; under tail-coverts ferruginous; bill horny brown, paler on lower mandible; irides brown; legs pale horny.

Length.—7 to 7·7 inches, wing 2 to 2·3, tail 4, bill at front 0·4.

Hab.—Sind, the Punjab, N. W. Provinces and Bengal; breeds in Sind from July to September.

Family, BRACHYPODIDÆ,—SHORT-LEGGED THRUSHES.

Legs and feet short; wings moderate or rather long; bill various.

Sub-Family, PYCNONOTINÆ,—TRUE BULBULS.

Bill generally short, straight and depressed; rictal bristles well developed; nostrils exposed.

Gen. **Pycnonotus.**—*Boie, Isis,* 1826.

Bill rather long and thin; gongs up-curved; rictal bristles strong; legs and feet stout; tarsi with a single scute at insertion of feet; toes scutellate; head more or less crested, but not conspicuously.

Pycnonotus hæmorrhous; *Blyth, J. A. S. B.* xiv. p. 566; *id.* xv. p. 50; *Gray, Gen. B.* i. p. 237; *Jerd. B. Ind.* ii. p. 94, No. 462; *Str. F.* 1875, p. 292; *Sharpe, Cat. B. B. Mus.* vol. vi.; *Murray, Hdbk., Zool., &c., Sind.* Hæmatornis hæmorrhous, *Swains, Faun. Bor. Amer. B.* p. 485. Pycnonotus pusillus, *Gray, Gen. B.* i. p. 237; *Str. F.* 1878, p. 258; *Hume,* l. c. p. 456; *Str. F.* 1877, p. 246; Molpastes hæmorrhous, *Hume, Str. F.* 1879, p. 98.—THE COMMON MADRAS BULBUL.

Head crested, black; chin and throat black; neck, back and wing-coverts brown, more or less pale edged; upper tail-coverts white; tail brownish black, tipped with white; breast brown, all the feathers edged with white or ashy; lower abdomen and vent white; flanks and thigh-coverts light brown; under tail-coverts crimson; under wing-coverts whitish; bill black; legs greenish or slaty green; irides deep brown.

Length.—7·75 to 8 inches, wing 3·4, tail 3·4, tarsus 0·8, bill at front 0·9.

Hab.—Ceylon, Southern and Central India (Mhow, Travancore), Deccan, Concan, Malabar, Kutch, Kattiawar, Jodhpore and North Guzerat; also the Punjab, N. W. Provinces, Bengal and Oudh. In Sind it appears to be a permanent resident, breeding from June to August. Eggs 2—4, white, speckled with lake red or deep claret.

Pycnonotus leucotis, *Ixos. apud. Gould. P. Z. S.* 1836, p. 6; *Bp. Consp. Av.* i. p. 265; *De F. Viag. Pers.* p. 347. Pycnonotus leucotis, *Blyth, J. A. S. B.* xiv. p. 567; *Blf. East. Pers.* ii. p. 218. Otocompsa leucotis, *Jerd. B. Ind.* ii. p. 91, No. 459; *Hume, Str. F.* 1873, p. 181; *id.* 1875, p. 206; l. c. p. 473; 1879, p. 98; *Murray, Hdbk., Zool., &c., Sind,* p. 143.—THE WHITE-EARED CRESTED BULBUL.

Head, hind neck, round the eye, forecheek, chin, throat and upper breast black; back, wing-coverts, scapulars, and upper tail-coverts earthy brown; quills dusky brown; the outer webs like the back; ear-coverts and hinder part of cheeks white; tail dark brown, lighter at their bases, all the feathers tipped with white; lower breast and abdomen ashy brown; thigh-coverts dusky brown; under tail-coverts rich golden or saffron yellow; bill horny brown; irides dark brown; legs and feet dark brown.

Length.—7 inches, wing 3·5, tail 3·25, tarsus 0·9.

Hab.—Western and Northern India, Beloochistan (Khelat, Bolan, Mekran Coast and Quetta), S. Afghanistan (Chaman), Persia. Common in the Punjab and N. W. Provinces. Resident in Sind. Breeds from April to July.

Sub-Family, ORIOLINÆ,—Orioles.

Nostrils in front of the base of the bill, bare; bill, with a notch in the upper mandible, slightly curving; wings long, 3rd and 4th quills longest; tail rather short, nearly even; outer toe syndactyle.

Gen. **Oriolus**, *Linn. S. N.* i. p. 160.

Lores feathered, but generally with a little bare space behind the eye; 3rd quill longest.

Oriolus galbula, *Linn. S. N.* i. p. 160; *Naum. vogt. Deutsch.* ii. tab. 61; *McGill. Br. B.* ii. p. 69. *Gould. B. Eur.* ii. pl. 71; *Gray, Gen. B.* i. p. 232; *Layard, B. South Afr.* p. 135; *Shelley, B. Egypt,* p. 156; *Sharpe, Ibis.* 1870, p. 215; *id. Cat. Afr. B.* p. 53; *Hume, Str. F.* 1873, p. 182; *Murray, Hdbk., Zool., &c., Sind,* p. 143.—The Golden Oriole.

Adult Male.—Golden yellow, a blackish brown spot between the eye and the bill; wings and tail black; a yellow spot on the quills not far from the middle of the wing when closed; tail feathers terminated with yellow; bill reddish maroon; iris red; feet bluish grey.

Length.—Rather more than 10 inches, bill at front 1, wing 5·9, tail 3·1, tarsus 8.

Adult Female.—Greenish olive above, greyish white with a yellowish tinge below, where the plumage is marked by some white distant greyish brown stripes or dashes disposed longitudinally; wings brown, bordered with olivaceous grey; tail olivaceous, tinged with black; beneath yellowish with a brownish black mark somewhat in the form of an irregular Y; no dark streak behind the bill and the eye.

The young of the year resemble the female, but the longitudinal stripes of the lower parts are more numerous and deeper in colour; bill blackish grey; iris brown.

It is said to breed in parts of Europe, laying generally four or five eggs, white or purplish white, speckled with lake red and dusky.

Hab.—The whole of Europe, S. W. Asia, South Africa and Persia. A visitant in Sind during October and November.

Oriolus kundoo, *Sykes, P. Z. S.* 1832, p. 87; *Gray, Gen. B.* i. p. 232; *Blyth, J. A. S. B.* xv. p. 49; *Jerd. B. Ind.* ii. p. 107, No. 470; *Hume, Lahore to Yarkand*, p. 167; *Murray, Hbdk., Zool., &c., Sind*, p. 143.—The Indian Oriole.

Adult Male.—Bright golden yellow above and below; lores, feathers round the eye and a streak through the eye black; scapulars externally black; the edge of the wing and a bar formed by the primary coverts yellow; the bases of the primary coverts black; quills black; the primaries edged with yellow; secondaries with yellow tips; tail with the central feathers black and narrowly yellow tipped, the next pair black, with a broad yellow tip, the others black at the base and yellow for the greater part of their terminal length; under wing and tail-coverts golden yellow; bill deep lake red; legs plumbeous; irides blood-red.

Length.—9 to 9·5 inches, wing 5·5, tail 3·5, tarsus 0·95. The female is like the male, but with a slightly greenish tint.

Hab.—India generally to Nepaul, Cashmere and Eastern Turkistan. Probably a resident in Sind, but nothing is known of its nidification in the Province. Specimens have been obtained in April, June, September and December. The September birds were the young of the year. Occurs also in the Deccan and North Guzerat.

Family, SYLVIADÆ,—Warblers.

Bill slender; wing usually somewhat lengthened; tail moderate or short; tarsus long.—(*Jerd.*)

Sub-Family, SAXICOLINÆ,—Stone Chats and Warblers.

Gen. Copsychus.—*Wagler.*

Bill moderately long and strong, tip slightly bent; rictal bristles few; nostrils basal, exposed; 4th and 5th quills longest; tail rather long; tarsus moderately long.

Copsychus saularis, *Linn.; Edw. B.* pl. 181; *Jerd. B. Ind.* ii. p. 114, No. 475; *Hume, Str. F.* ii. 230; *id.* vi. 332; *Murray, Hdbk., Zool., &c., Sind*, p. 145. Kittacincla melanoleuca, *Less. Rev. Zool.* 1840, p. 354. Gryllivora intermedia, *Swains. and Jerd. Cat.* 101.—The Magpie Robin.

Head, neck all round, back, wings, chin, throat, breast, central tail feathers and upper abdomen black, glossed blue; four lateral tail feathers on each side white; lower abdomen, vent and under tail-coverts, also the shoulder of the wing and some of the outer webs of the secondaries white. The female is duller black; the breast ashy; bill black; legs black; irides brown.

Length.—8 to 8·5 inches, wing 4, tail 3·25, bill at front 0·8.

Hab.—India generally, from the Himalayas to Cape Comorin and Ceylon, eastwards to Arrakan and Tenasserim. Occurs in the Deccan rather abundantly, and sparingly in Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Central India, Kutch, Kattiawar, Guzerat and Jodhpore.

Gen. **Thamnobia**,—*Sws.*

Bill slender, slightly widened at the base, sides compressed; 4th and 5th quills longest; secondaries and tertiaries broad, nearly the length of the primaries; tail moderate.

Thamnobia cambaiensis, *Lath.*; *Jerd. B. Ind.* ii. 122, No. 480; *Hume, Str. F.* i. 182; *Murray, Hdbk., Zool., &c., Sind*, p. 145. (*Foosree*, Sind).—THE BROWN-BACKED INDIAN ROBIN.

Male.—Head dusky olive brown; lores, ear-coverts, lower plumage, wings and tail black; back, scapulars and upper tail-coverts dusky olive brown; under tail-coverts and centre of lower abdomen deep chestnut; a white wing spot. The female is sooty brown throughout; vent and under tail-coverts chestnut; bill and legs black; irides brown.

Length.—6 inches, wing 2·8 to 3, tail 2·75, tarsus 1, bill at front 0·5.

Hab.—Central and Northern India to the Himalayas. Found commonly in the Punjab, N. W. Provinces, Sind, Kutch, Kattiawar, N. Guzerat, Jodhpore, the Concan and Deccan, also in Khandeish, and, as in Sind, is probably a resident of these places. In Sind it breeds from March to July. Eggs white or pale greenish white, speckled with pale red.

Gen. **Pratincola**, *Koch. Syst. d. Baier. Zool.* p. 190.

Bill short, straight, wider at the nostrils than high; nostrils hidden; second primary longer than the secondaries, the first not half the length of the second.

Pratincola macrorhyncha, *Stolickza, J. A. S. B.* xli. p. 238; *Hume, Str. F.* 1876, p. 40; 1877, pp. 131, 241, 244; 1879, p. 53. Pratincola rubetraoides, *Jerd. B. Ind.* iii. *App.* p. 872 (*ex. Jameson MS. Desc. Nulta*) *Dresser, B. Eur.* parts 23, 24; *Hume, Str. F.* 1877, p. 239. Pratincola rubetra, *Hume, Ibis.* 1869, p. 354. Pratincola Jamesoni, *Hume, Str. F.* 1877, p. 239 (*nom emende*) *Sharpe, Cat. Birds, B. Museum.* vol. iv. p. 182.

Adult Male.—A broad stripe over the eyes and over the greater portion of the ear-coverts white, with a slight buffy tinge; lower parts of the lores dusky; chin, throat and entire lower parts, including lower tail-coverts and tibial plumes, white with a yellowish tinge and a very feeble rufescent tinge on breast and flanks; wing lining and axillaries pure white, the former slightly mottled with dusky; forehead, crown, occiput, nape, back and scapulars light sandy buff, striated longitudinally with hair brown; rump and upper tail-coverts white, most of the feathers tinged towards their tips with pale rusty buff; primaries and secondaries hair brown, margined on the outer webs with light buff and tipped with yellowish white, the primaries more narrowly, the secondaries more broadly; tertiary, greater coverts, or perhaps, I should call them lower scapulars, white; tertiaries and greater and median secondary coverts deep brown, broadly margined with pale, more or less rufescent buff; entire visible portion of lesser coverts pale sandy buff; edge of wing and outer webs of earlier greater primary coverts pure white; tail hair brown, all the feathers margined on the outer

webs with sandy buff or light yellowish brown; the outer web of the outermost feather almost entirely of this colour; all the feathers, except the central pair, with almost the entire inner webs, white, the outermost pair have an irregular subterminal brown band from 0·2 to 0·3 inch wide on this web, but the rest have only a small patch of brown near the shaft close to the tip, the pair next the centre have the patch rather larger; there are traces of a dark streak from the base of the lower mandible down either side of the throat, expanding on the sides of the breast; doubtless in breeding plumage this streak and patch are black or blackish; bill and feet black; iris brown.

Length.—6 inches, culmen 0·7, wing 3, tail 2·12, tarsus 0·97.—(*Hume*).

Breeding Plumage.—Two or three of both my males and females have the lower parts of the lores, cheeks, ear-coverts and entire sides of the throat (leaving only a narrow pure white stripe down the centre of the throat) black; the feathers only a little tipped with pale sandy, which doubtless in the breeding season entirely disappears; also the lesser and median, and secondary greater wing-coverts and the winglet have become nearly black, only very narrowly edged with sandy buff, which colour also seems in the course of disappearing.—(*Hume*).

Adult Female in winter plumage similar to the male, but smaller and showing the dark streak and patch much less.

Length.—5·5 inches, culmen 0·7, wing 2·9, tail 2, tarsus 0·93.—(*Hume*). *Ex Sharpe, Cat. B. Br. Mus.* vol. iv. p. 188.

Hab.—Sind, Punjab, and N. W. Provinces. Mr. Hume gives the following distribution of this species in vol. vii. of *Stray Feathers*, p. 55 :—"Punjab (Goorgaon, Umballa, Sirsa, Hansi, Shahpoor and probably all western districts); Rajputana (Jodhpore, Biccaneer, Jeysulmere); North Guzerat, Kutch, Sind (Thurr and Parkur districts) and probably elsewhere." I got it at Chaman (Afghanistan), and in the Bolan Pass, Beloochistan.

Pratincola indica, *Blyth, J. A. S. B.* xvi. p. 129; *id. Cat. Mus. A. S. B.* p. 170; *Bp. Consp.* i. p. 305; *Str. F.* 1873, p. 355; 1875, p. 138; l. c. p. 475; 1876, pp. 142, 259, 275, 327; 1877, p. 36; *Jerd. B. Ind.* ii. p. 124, No. 483; *Murray, Hdbk., Zool., &c., Sind*, p. 145. Pratincola maura, *Pall. Reis.* ii. *Anhang.* p. 708; *Gm. Syst. Nat.* i. p. 975; *Sharpe, Cat. Birds, Br. Mus.* vol. iv. p. 188. Pratincola robusta, *Tristr. Ibis.* 1870, p. 497; *Brooks, Str. F.* 1876, p. 274; *Hume, Str. F.* 1877, p. 131; 1878, p. 335; vii. p. 55. Pratincola rubicola, *Pt., Severtz. Turkst. Jevotn.* p. 65; *Dresser, B. Eur.* pt. 23, 24.—The Indian Bush Chat.

Adult Male.— Head, neck, chin, throat, sides of face, back, tail and wings black; the feathers of the back and scapulars, (some of which are white tipped) edged with pale rufous, and the tail basally white; the quills dusky brown, margined with sandy brown, as are also the wing-coverts and secondaries; a large wing patch, rump, upper tail-coverts, and sides of neck forming a demicollar, white; foreneck and breast bright ferruginous; abdomen, vent and under tail-coverts white, slightly

tinged with fulvous; axillaries black. In winter plumage, the general colour above is brown, the rump and upper tail-coverts rusty, also the entire under surface, but duller. The adult female is brown above with pale rufous edges to the feathers, and the edgings to the wing-coverts and scapulars much lighter; the wing patch is much smaller and less distinct; the rump and upper tail-coverts a rufescent buff; cheeks and throat fulvous ashy, and the entire under surface a sullied white or pale buff; the axillaries also buffy; the bases of the feathers brownish; bill and legs black; irides brown.

Length.—4·5 to 5·5 inches, wings 2·75, tail 1·75, tarsus 0·85.

Hab.—India generally during the winter, also China, Japan, Cashmere, Nepaul, N. W. Himalayas, Upper Burmah, Eastern Turkistan, Abyssinia, Beloochistan (Bolan and Quetta), Afghanistan (Chaman and Gulistan). Occurs in Sind, Kutch, Kattiawar, Jodhpore, Jeypore, North Guzerat, the Deccan, Kamptee, in Central India and Darjeeling.

Pratincola leucura, *Blyth, J. A. S. B.* xiv. p. 474; *Bp. Consp.* i. p. 305; *Jerd. B. Ind.* ii. p. 126, No. 484; *Hume, Str. F.* 1873, p. 183; 1874, p. 478; 1875, p. 135; *Murray, Hdbk., Zool., &c., Sind.*, p. 145.—The White-tailed Bush Chat.

Adult Male in Summer Plumage.—Above black; rump duller; upper tail-coverts white; central tail feathers blackish brown, basally white, the others dark brown on the outer web and white on the inner; wings black; quills duller, margined pale brown; a white wing spot; breast bright rufous; sides of head and throat black; on the sides of the neck a white patch, broader at the lower throat; rest of under surface pure white, tinged with rufescent on the sides; under wing-coverts black, edged with white. "In the winter plumage the male is nearly a sandy brown above, almost uniform, the black centres to the feathers being effectually concealed; upper tail-coverts white, sandy rufous at their ends; tail feathers dark brown, edged with sandy colour; the inner webs white, slightly shaded with sandy buff at the tips; wings black, with broad sandy brown edges to the feathers; the inner secondaries margined with rufous, some of the feathers forming the white wing patch, edged with brown; a loral line of ashy white; feathers in front of and round the eye black, with sandy brown edgings; throat black, obscured by ashy white margins to the feathers; on each side of the lower throat a white patch half concealed by rufous tips to the feathers; breast and sides of body orange rufous, the feathers edged with sandy buff; plumes on the sides of the upper breast white, tipped rufous; under wing-coverts and axillaries white with dusky bases."—*Sharpe, Cat. B. Br. M.*

"The *adult female* is earthy brown, with more or less distinct remains of sandy brown edges; upper tail-coverts sandy buff; tail feathers brown, dull white along the basal portion of the inner web; wings brown, with buffy white tips to the greater coverts; wing patch smaller than in the males; lores fulvous, extending over the forepart of the eye; round the latter a ring of sandy buff; ear-coverts brown with fulvous shaft-lines; cheeks and throat white;

breast and sides of body paler orange buff; the centre of the abdomen buffy white; under wing-coverts and axillaries pale sandy buff with dusky bases; quills brown below, whitish along the edge of the inner web; bill and feet brownish black; irides brown."—*Sharpe, Cat. B. M.*

Length.—5 inches, wing 2·5, tail 2, bill at front 0·5.

Hab.—India and Burmah; N. W. Himalayas, Sind, Punjab, at Mooltan, and the Gangetic Valley, where Jerdon states he found it most abundant from Rajmahal to Monghyr, frequenting fields and long grasses. It winters in Sind and Punjab.

Pratincola caprata, *Linn. S. Nat.* 1. p. 325. Œnanthe caprata, *Viell. N. Dict.* xxi. p. 433. Saxicola bicolor, *Sykes, P. Z. S.* 1832, p. 92. Pratincola caprata, *Blyth, J. A. S. B.* xvi. p. 129; *Bp. Consp.* i. p. 305; *Jerd. B. Ind.* ii. p. 123, No. 481; *Hume, Str. F.* 1873, pp. 182, 379; 1874, pp. 413, 477; 1875, p. 134; 1877, p. 229; 1876, p. 259; *Str. F.* 1875, p. 238; *Blanfd. Eastern Persia*, p. 144; *Murray, Hdbk., Zool., &c., Sind*, p. 145. Pratincola atrata, *Blyth, J. A. S. B.* xx. p. 177; *Jerd. B. Ind.* ii. p. 124, No. 482. Pratincola bicolor, *Hume, Nest and Eggs, Ind. B.* p. 314.—The White-winged Black Robin.

Adult Male.—Head, neck all round, throat, breast, sides of the face, back, wings, tail and entire under surface black; under wing-coverts black; vent, under tail-coverts, rump, upper tail-coverts and wing patch white; some of the feathers of the lower abdomen very slightly edged with white. The young male is dark brown, the feathers of the upper and lower surface with brownish edgings; the quills dark brown with whitish tips, and the lower abdomen, vent and upper tail-coverts, as well as the wing patch, white. The female is dusky brown, the feathers edged pale, and with dark centres to the feathers of the head, scapulars and back; rump and upper tail-coverts rufescent; tail dark brown, as also are the wing-coverts and quills, but margined with lighter brown; beneath pale reddish or ochraceous brown, whitish on the throat; vent and under tail-coverts white, with a slight rufous tinge; bill and legs black; irides dark brown.

Length.—5 to 5·4 inches, wing 2·75, tail 2·1, tarsus 0·8, bill at front 0·45.

Hab.—India generally, Ceylon, Southern India, Burmah, Java, and Phillipines. In the Indian region it extends to the Himalayas, and is extremely common throughout Sind, the Punjab, Beloochistan, S. E. Persia and S. Afghanistan, at Chaman, Gulistan, Dubrai and Kandahar; also occurs all along the Western Coast, Kutch, Kattiawar, Jodhpore, North Guzerat, the Deccan and Concan. Breeds in Sind during March and April. Eggs usually three, pale greenish white, speckled finely with brown.

Gen. **Saxicola**.—*Bechst.*

Bill rather flat at base; nostrils in a membranous groove, opening rounded; wings long; 3rd and 4th quills longest; tail even; outer toe longer than inner.

Saxicola albonigra, *Hume, Blanf. and Dresser, P. Z. S.* 1874, p. 226; *Blf. East. Persia*, ii. p. 153, pl. xi. *Seebohm, Cat. B. Br. Mus.* p. 366. Saxicola alboniger, *Hume, Str. F.* i. p. 2 (1873). Dromolæa alboniger, *Hume, Str. F.* i. p. 185; *Murray, Hdbk., Zool., &c., Sind*, p. 146.—Hume's Pied Stone Chat.

Adult Male.—Head, neck, upper back and throat black; quills dark brown; under wing-coverts and axillaries black; tail white, with a broad terminal band of dark brown, broader on the two central feathers; lower back, rump, upper tail-coverts, breast, belly and under tail-coverts white; bill and legs black; irides dark brown.

Length.—7·5 inches, wing 4·25, bill at front 0·65.

Hab.—Sind, Beloochistan (Kundilanee, Abigoom, Bolan Pass and Bampusht, Kalagan, *Blf.*), South E. Persia, S. Afghanistan (Gulistan, Chaman, Dubrai, and Kandahar). Winters in Sind, and probably also in S. E. Persia.

Saxicola picata, *Blyth, J. A. S. B.* xvi. p. 131; *Bp. Consp.* i. p. 304; *Jerd, B. Ind.* ii. p. 131, No. 489; *Blf. and Dresser, P. Z. S.* 1874, p. 227; *Seebohm, Cat. B. Br. Mus.* p. 367; *Blf. Eastern Persia*, ii. p. 153; *Hume, Str. F.* i. pp. 3, 184. Dromolæa picata, (*Blyth*); *Gould. B. Asia*, pt. xvii.—The Pied Stone Chat.

Head, neck, back, throat and upper breast black; quills dark brown, much paler on the under surface; under wing-coverts and axillaries black; rump, upper tail-coverts, lower breast, under tail-coverts and vent white; the under tail-coverts in some specimens with a very faint tinge of buffy; tail white, the two central feathers black for their terminal half, and the others for about one-fourth terminated with blackish brown; bill and legs black; irides dark brown.

Length.—6·25 to 6·5 inches, wing 3·7, tail 2·75, bill at front 0·5.

Hab.—Sind, Beloochistan, S. E. Persia, S. Afghanistan, the Punjab. N. W. Provinces, Oudh, and Guzerat. Breeds in Persia and South Afghanistan.

Saxicola capistrata, *Gould. B. Asia*, pt. xvii. 1865; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 368; *Gray, Handlist B.* i. p. 224. Saxicola leucomela, (*Pall*) *apud. Blyth, J. A. S. B.* xvi. p. 131; *apud. Jerd. B. Ind.* ii. p. 131, No. 490. Saxicola morio, *Hemp. et Ehr. apud. Blanf. and Dresser, P. Z. S.* 1874, p. 225 (*partim*); *apud. Severtz. Str. F.* iii. p. 429.—The Indian Stone Chat.

Adult Male in Breeding Plumage.—Head and nape greyish white, shading into white on the hind neck and eye stripes; lores, chin, throat, ear-coverts, sides of neck, scapulars, back, wing-coverts, axillaries and under wing-coverts black; quills dark brown, slightly paler on the under surface; rump, upper tail-coverts, breast, flanks, belly and under tail-coverts white, the latter occasionally suffused with buff; tail white, the two central feathers nearly black for the terminal half, and the remainder tipped with nearly black from a quarter to half an inch; bill and legs black; wings, 3rd, 4th and 5th primaries nearly equal and longest; second, intermediate in length between the 6th and 7th; bastard primary 0·9 to 0·7.

Length.—Wing 3·7 to 3·5, tail 2·7 to 2·4, culmen 0·7 to 0·62, tarsus 1·1 to 0·9. *Female* unknown.—(*Seebohm*).

Hab.—North, Western and Central India, and Sind during winter. Breeds in Turkistan and probably Afghanistan also.—(*Seebohm, Cat. B. Br. Mus.* p. 368).

Saxicola monacha, *Rupp. fide Tem. Pl. Col.* No. 359, fig. 1; *id. Syst. Uebers.* p. 58; *Gray, Handlist B.* i. p. 226; *Shelley, B. Egypt*, p. 78, *Sharpe and Dresser, B. Eur.* pt. xvi. *Blf. and Dresser, P. Z. S.* 1874, p. 227; *Blf. East. Pers.* ii. p. 150; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 369. Saxicola pallida, *Rupp. fide Cretzschm, Rupp. Atl.* xxxiv.; *Gray, Handlist B.* i. p. 224, No. 3213. Dromolæa monacha, (*Rupp.*), *Bp. Consp.* i. 302; *Hume, Str. F.* 1873, p. 186. Saxicola gracilis, *Licht. Nom. Av.* p. 35.—The Hooded Stone Chat.

Adult Male.—General colour black; quills dark brown, paler on under surface; head, nape, upper and lower tail-coverts, belly, and flanks white; tail white, except the terminal half of the two central feathers, and the tips of others, which are very dark brown; bill and legs black; irides brown.

Length.—7 to 7·25, wing 4 to 4·42, tail from vent 2·75, tarsus 0·9, bill at front 0·62.

Adult Female.—General colour very similar to the male, but browner, and the white parts suffused or tinged with buffy.

Hab.—Sind, Beloochistan, Persia, Egypt, Nubia and Palestine; wintering in Sind. Said to be resident in Persia and Egypt.

Saxicola morio, *Hemp. et Ehr. Symb. Phys.* fol. a. a.; *Dresser, B. Eur.* pt. xxvii. (1874 *partim*). *Dresser and Blf. Ibis.* 1874, p. 338; *Blf. East. Pers.* ii. p. 152; *Wardl. Ramsay, Ibis.* 1880, p. 55; *Seebohm, Cat. Birds Br. Mus.* p. 372. Saxicola leucomela, (*Pall*), *Tem. Man. d'Orn.* i. p. 243; *Gould. B. Eur.* ii. pl. 89; *Gray, Gen. Birds*, i. p. 178, *Bp. Consp.* i. 303; *Severtz. Str. F.* 1875, p. 429. Saxicola Hendersoni, *Hume, Ibis.* 1871, p. 408; *Hume and Henderson, Lahore to Yarkand*, p. 206, pl. xiii.—The White-headed Stone Chat.

Adult Male.—General colour black; quills dark brown, paler on the under side; head, nape, hind neck, rump, upper and lower tail-coverts, breast, flanks, and belly, white; the head and nape tinged greyish; tail white, the two centre feathers black for the terminal half, and the others tipped black from a quarter to half an inch; bill and legs black; irides brown.

"*Length.*—Wing 3·9 to 3·6 inches (*Female* 3·6 to 3·45), tail 2·66 to 2·25, culmen 0·7 to 0·6, tarsus 1·0 to 0·85."—(*Seebohm*). *Female*, like the male, but the upper parts earthy brown.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Cashmere, Palestine, and Egypt. Winters in Sind, Arabia, Abyssinia, and breeds (according to Seebohm) in Cyprus, Crimea, Caucasus, Persia, Afghanistan and Turkistan; also in Western Thibet, Mongolia, Siberia, and N. W. China.

Saxicola opistholeuca, *Strickl.*; *Jard. Contr. Orn.* 1849, p. 60; *Blyth, Cat. B. Mus. A. S.* p. 167; *Gray, Handlist B.* i. p. 226; *Blanf. and Dresser, P. Z. S.* 1874, p. 229; *Seebohm. Cat. B. Br. Mus.* vol. v. p. 376. Saxicola leucura, *Gmel. apud. Blyth, J. A. S. B.* xvi. p. 131. Saxicola leucoroides, *Guer. apud. Jerd. B. Ind.* p. 130. Saxicola syenitica, *Heugl. apud. Severtz. Turkest. Jevotn.* p. 65. Saxicola leucopyga (*Brehm?*) *Dresser, Ibis.* 1875, p. 337; *Str. F.* vol. viii. p. 473; *Murray, Hdbk., Zool., &c., Sind,* p. 146.—The Indian White-tailed Stone Chat.

Entire head, neck, back, throat, breast, belly, wings, and under wing-coverts black; quills dark brown; rump, upper and under tail-coverts, vent and tail, white; the terminal half or a little more of the two central feathers of the tail, and the tips of others from a quarter to half an inch deep, dark brown; bill and legs black; irides dark brown.

Length.—6·5 inches, wing 3·75, tail 2·75, bill at front 0·68. *Female, length* 6·5, wing 3·52, tail 2·6, tarsus 0·95 to 0·99.

Hab.—Sind, Punjab, (at Mooltan and Cheechawutnee), N. W. Provinces, Beloochistan, (Quetta, May 21st), Afghanistan (Chaman), and S. W. Turkistan. Occurs also in Jodhpore, and probably in Kutch and Kattiawar.

Saxicola deserti, *Tem. Pl. Col.* pl. 359, fig. 2; *Rupp. Syst. Uebers.* p. 58; *Gray, Gen. B.* i. p. 179; *Bp. Consp.* i. p. 303; *Jerd. B. Ind.* ii. p. 132, No. 492; *Blf. Geol. and Zool. Abyssinia,* p. 362; *Shelley, Birds Egypt,* p. 74; *Blf. East. Pers.* ii. p. 148; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 383. Saxicola atrigularis, *Blyth, J. A. S. B.* xvi. p. 131; *Gould. B. of Asia,* pt. xvii. Saxicola homochroa, *Tristram, Ibis.* 1859, p. 59; *Heugl. N. O. Afr. B.* i. p. 343; *Shelley, B. Egypt,* p. 75.—The Black-throated Wheatear.

Top of head, neck, back, scapulars, breast and belly buff; upper and under tail-coverts very pale buff; chin, throat, lores, behind the eye, and terminal half of the tail black; the two central feathers of the tail with the black for nearly a quarter of an inch higher from the base than the others; basal half of tail feathers and a supercilium from the base of the bill to the nape, white; wings and wing-coverts dark brown, the secondaries margined on the outer webs with buff; tertiaries lighter, broadly margined and narrowly tipped with buffy, the basal half of inner webs of all margined with white; axillaries and under wing-coverts black, some of the feathers white tipped; bill and legs black; irides hazel.

Length.—6·75 to 7 inches, wing 3·9 to 4, tail 2·75, tarsus 1 to 1·1, bill at front 0·5.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, S. E. Persia, Afghanistan, E. Turkistan, Arabia, Egypt, Palestine, Nubia. Occurs also in Central India, Deccan, Concan, Kutch, Kattiawar, Jodhpore and North Guzerat.

Seebohm, in his *Cat. B. Br. Mus.* p. 385, describes—**Saxicola montana**, *Gould. B. As.* pt. xvii. from Gwadur, Yarkand and Cashmere. I have a long series of the Desert Chat from Beloochistan, S. Afghanistan, Sind, and Sibi in Afghanistan, and all have the basal half of the inner webs of quills margined white. *S. deserti* and *S. montana* I believe to be the same species, the differences, if any, are due to seasonal changes. In one stage of plumage (autumn and beginning of winter) the edge of the wing is a mixture of buffy white and black, the axillaries whitish, and the black feathers of the throat tipped with buffy white.

Saxicola chrysopygia, *De. Fillippi, Arch. Zool. Genova*, ii. p. 381; *id. Viag. Pers.* p. 347; *Gray, Handlist B.* i. p. 226; *Blf. East. Pers.* ii. p. 151; *Seebohm, Cat. B. Br M.* p. 389; *Murray, Hdbk., Zool., &c., Sind*, p. 148. Saxicola kingi, *Hume, Ibis.* 1871, p. 29; *id. Str. F.* i. p. 187; vii. p. 57.—The Red-tailed Wheatear.

A dark grey line from the gape to and under the eye; a broad slightly greyish white line from the nostrils over the eye, much more conspicuous in some specimens than in others; ear-coverts silky rufescent brown; forehead greyish brown; crown, occiput, nape, back and scapulars, nearly uniform grey-earthy brown, as a rule only very slightly tinged with rufescent towards the rump; but in some specimens more strongly so; rump and upper tail-coverts bright rufous fawn, in some specimens pale rufous buff; tail feathers bright, in some pale, ferruginous, with a sub-terminal blackish brown band extending over both webs, and a narrow tipping of rufous white jets in at the shafts for about the tenth of an inch; occasionally on the lateral feathers, the black bar is more or less imperfect, the dark band is from 1·1 to 1·4 broad on the central tail feathers, about 0·6 to 0·8 on the feathers next the centre, and 0·4 to 0·6 on the external ones. The tertiaries and most of the coverts are hair brown broadly margined with pale rufescent; the winglet, primaries, and secondaries, and primary greater coverts are slightly darker hair brown, very narrowly tipped with white, and some of them, the secondaries especially, very narrowly margined with pale rufescent; the chin and upper throat white with a faint creamy tinge; the sides of the neck, behind and below the ear-coverts, grey, greyish white and greyish brown, blending on the one side into the colour of the throat, and on the other into that of the back of the neck. The breast and upper abdomen are a very pale rufescent brown, all the tips of the feathers being paler. The centre of the abdomen and vent slightly rufescent white; flanks rufescent fawn; lower tail-coverts a somewhat pale buff; wing lining and axillaries pure white; legs and feet black; bill black; irides dark brown.

Length.—6·2 to 6·5 inches, expanse 10 to 11·3, tail from vent 2·2 to 2·4, wings when closed reach to within 0·7 to 1·5 of end of tail, wing 3·7 to 4·4, the 3rd primary is the longest, the second 0·25, and the 1st 2·0 shorter than the third, the tail is perfectly square; bill, length at front 0·55 to 0·6, tarsus 1 to 1·01; foot, greatest length 1·15 to 1·3;

mid-toe to root of claw, 0·55 to 0·65, its claw straight, 0·2 to 0·24.—(*Hume, Str. F.* vol. i. p. 187.)

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, S. E. Persia, Afghanistan, Kutch, Kattiawar, Jodhpore and North Guzerat. In one specimen I possess a female collected at Kurrachee in January, the feathers on the crown of the head are dark shafted, the tertiaries are tipped greyish white, and the edge of wing is also greyish white, with a few dusky spots; the basal third or a little more of the inner webs of the primaries, secondaries, and tertiaries narrowly margined with white.

Saxicola isabellina, *Cretszchm. Rupp. Atl.* p. 52; *id. Syst. Uebers.* p. 58; *Bonap. Consp.* i. p. 304; *Gray, Handlist B.* i. p. 225; *Blf. and Dresser, P. Z. S.* 1874, p. 229; *Dresser, B. Eur.* pl. xxviii. 1874; *Blf. East. Pers.* ii. p. 147; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 400. Motacilla stapazina, *Pall. Zoogr. Rosso. As.* i. p. 474; *ex. Willoughby nec.* Motacilla stapazina, *Lin.* Saxicola saltator, *Menet. Cat. Rais. Cauc.* p. 30. *Severtz. Jevotn. Turkest.* p. 65. Saxicola œnanthe (*Linn.*) *apud. Jerd. B. Ind.* ii. p. 132; *Hume, Str. F.* i. pp. 45, 48,187; vii. pp. 57, 95,112; *Murray, Hdbk., Zool., &c., Sind*, p. 148.—THE WHEATEAR.

Adult Male.—Head, neck, back, and scapulars sandy brown. A stripe from the nostrils, above the eye as a supercilium; the nape white, or buffy white, a narrow black stripe below this from the gape to the eye; chin buffy white; throat, breast, and belly, pale buff, darker on the breast; rump and upper tail-coverts white; under tail-coverts also white, tinged with buffy; primaries, their coverts, secondaries and tertiaries brown, margined on their outer webs with whitish or buffy white; the secondaries (in all Sind specimens) tipped with whitish; wing-coverts brown, margined with pale rufescent brown; ear-coverts rufescent brown; tail white, the terminal half of the central feathers and about one-third of the others dark brown; axillaries and under wing-coverts white; bill and legs black; irides light brown.

Length.—6·5 to 6·75 inches, wing 3·75 to 4, tail 2·75.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Persia, Afghanistan, Eastern Turkistan, Cashmere, Palestine, Abyssinia, Thibet and North China. Breeds in Asia Minor, winters in Sind, N. W. Provinces, Punjab, Egypt, Nubia and Abyssinia. Occurs also in Kutch, Jodhpore, Deccan, Kattiawar and North Guzerat.

Sub-Family, RUTICILLINÆ,—REDSTARTS.

Bill slender with tip entire, rictal bristles fairly developed; wings and tail various; tarsi long, slender.

Gen. **Ruticilla**.—*Brehm.*

Bill rather short, broad at base; nostrils in a membranous groove; wings long and rounded; 5th and 6th quills longest.

Ruticilla rufiventris, *Jerdon, B. Ind.* ii. p. 137, No. 497; *Gray, Handlist B.* i. p. 221; *Blanf. East. Persia*, ii. p. 163; *Murray, Hdbk.*,

Zool., &c., Sind, p. 152; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 342; Ruticilla phœnicuroides, *Moore, P. Z. S.* 1854, p. 25, pl. lvii.; *Jerd. B. Ind.* ii. p. 136; *Gray, Handlist B.* i. p. 221. Ruticilla erythroprocta, *Gould. apud. Hume and Hender. Lahore to Yarkand*, p. 208; *apud. Severtz. Turkest. Jevotn.*—The Indian Redstart.

Adult Male.—Crown of head ashy grey; throat, neck, lores, ear-coverts, breast, back and wing-coverts dark brown or black, the feathers edged greyish; wings dusky brown; the primaries and secondaries margined rufescent on their outer webs; breast, flanks, under wing-coverts, belly, rump, upper and lower tail-coverts and tail (except the inner, and part of the outer webs of the two central feathers, which are dark brown) uniform chestnut. The female is brownish above; the edge of the wings, belly, and inner tail-coverts pale rufous; bill and legs dark brown; irides brown.

Length.—6 inches, wing 3·3, tail 2·5, bill at front 0·55.

Hab.—India generally. Breeds in North China, Mongolia and Eastern Turkistan. Occurs in Sind, Beloochistan, South East Persia and Afghanistan during winter; also in Nepaul, Kashgar, Behar, N. W. Himalayas, Kutch, Kattiawar, Jodhpore, North Guzerat, the Concan and Deccan to South India.

Gen. **Cyanecula**.—*Brehm.*; Erithacus, *Cuv.*

Bill short, slender; rictal bristles small or obsolete; tarsi not scutellate; nostrils at base in a groove; wings moderate; 3rd and 4th quills longest.

Cyanecula suecica, *Lin. Sys. Nat.* i. p. 336 (*partim*) *Brehm. Vogt. Deutschl.* p. 350; *Gray, Gen. B.* i. p. 182; *Heugl. Orn. N. O.Afr.* i. p. 336; *Shelley, B. Egypt; Blf. East. Persia*, ii. p. 169; *Hume and Davison, Str. F.* vi. p. 337; *Legge, Birds of Ceylon*, p. 433; *Murray, S. F.* vii. p. 112; *id. Hdbk., Zool., &c., Sind*, p. 152; *Shelley, Ibis*, 1881, *Str. F.* ix. p. 330; viii. 304. Erithacus cæruleculus, *Pall. Zoogr. Rosso. Asiat.* i. p. 480; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 308. Cyanecula cæruleculus, (*Pall.*) *Bp. Consp.* i. p. 296; *Gray, Handlist B.* i. p. 223; *Jerd. Birds Ind.* ii. p. 152. No. 514.—The Indian Blue-Throat.

Head, neck, back, wings and wing-coverts pale brown; the feathers of the head slightly centred darker, and the wing-coverts and quills edged paler; lores dark brown; supercilium buffy white; chin, cheek, throat and breast, cobalt blue, with a large ferruginous or chestnut spot in the centre of the throat and breast; below the blue of the breast, a black band, followed by a chestnut one; rest of under surface buffy white; tail rufous or pale ferruginous, the two centre feathers and the terminal third of the others dark brown, lighter on the outermost; ear-coverts silky rufescent brown; bill dusky; gape yellow; legs dusky brown; irides dark brown.

Length.—5·5 to 6·5 inches, wing 3, tail 2 to 2·25. The female is like the male, but without the pectoral gorget; the throat, chin and neck buffy white, with a line of dusky brown from the base of the side

of the lower mandible, continued to, and across the breast; rest of under surface buffy white.

Hab.—Europe, Asia, and North Africa. Winters in the plains of India. Common in Sind, Punjab, N. W. Provinces, Bengal, and the whole of India, to Nepaul, and Cashmere; also in Beloochistan, S. E. Persia, Afghanistan, and E. Turkistan.

Sub-Family, CALAMOHERPINÆ,—GRASS and REED-WARBLERS.

Bill rather large, depressed and broad at the base; rictal bristles moderately developed; tail rounded; bastard primary very minute.

Gen. **Acrocephalus,** *Naum.* Calamoherpe, *Boie.*

Wings moderately long; 3rd and 4th quills longest; rictal bristles short, a few only; claws long; hind claw curved.

Acrocephalus stentoreus, *Hemp. et Ehr. Symb. Phys. Aves.* fol. b.b; *Heugl. Orn. N. O. Afr.* i. p. 287; *Shelley, B. Egypt,* p. 95; *Blf. East. Persia,* ii. p. 194. Agrobates brunnescens, *Jerd. Madr. Journ.* x. p. 269. Acrocephalus brunnescens, (*Jerd.*), *Blyth, Cat. B. Mus. As. Soc.* p. 181; *Jerd. B. Ind.* ii. p. 154, No. 515; *Hume and Henderson, Lahore to Yarkand,* p. 214, pl. xvi.; *Murray, Hdbk., Zool., &c., Sind,* p. 152; *Str. F.* vol. ii. 330; iii. 369.—THE INDIAN GREAT REED-WARBLER.

Above light olive brown, with a very slight ferruginous tinge, paler on the rump; wings and tail dark brown; the quills and lateral tail feathers pale edged; supercilium buffy white; chin white; throat greyish white, as also is the breast, but with a fulvous tinge; rest of under surface yellowish or fulvous white; bill dark brown, fleshy at base of lower mandible; irides yellowish; legs slaty brown.

Length.—7·5 to 8·5 inches, wing 3 to 3·35, tail 3, tarsus 1 to 1·1.

Hab.—India generally, extending to Nepaul. Appears to be a resident in Egypt; breeds in Turkistan and the highlands of Persia, also in Cashmere and Nepaul (*Seebohm*). In Sind it breeds in August. Probably also a resident of Beloochistan and Afghanistan, where it occurs in some numbers. Recorded from Rajputana, North Guzerat and Kutch.

Acrocephalus dumetorum, *Blyth, J. A. S. B.* xviii. p. 815; *Jerd. B. Ind.* ii. p. 155, No. 516; *Dresser, B. Eur.* part liii.; *Seebohm, Cat. B. Br. Mus.* v. p. 96. Calamodyta dumetorum (*Blyth*), *Gray, Handlist, B.* p. 207. Salicaria eurhyncha, *Severtz. Turkest. Jevotn.* pp. 66, 128; *id. Str. F.* 1875, p. 425.—BLYTH'S REED-WARBLER.

Upper parts olive brown; supercilium very pale, nearly obsolete; wings and tail slightly darker brown, narrowly edged paler on the outer webs; beneath brownish buff, paler on the chin and throat; under wing-coverts buffy white; bill dusky, fleshy at base of lower mandible; legs pale horn brown; irides yellowish.

Length.—6 inches, wing 2·5, tail 2·3, bill 0·7.

Hab.—Europe, breeds in the Himalyas, and winters in Sind, Punjab, N. W. Provinces, Deccan, Travancore, Ceylon, Neilgherries, the Carnatic, Central India, Bengal to Assam and Nepaul.

Acrocephalus agricola, *Jerd. Madras Journ.* xiii. pt. ii. p. 131; *Blyth, Cat. B. Mus. As. Soc.* p. 182; *Jerd. B. Ind.* p. 156, No. 517; *Murray, Hdbk., Zool., &c., Sind*, 153; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 105; *Dresser, B. Eur.* pt. liii. Salicaria capistrata, modesta et gracilis, *Severtz. Str. F.* 1875, pp. 425,426.—The Paddy-Field Warbler.

Above from pale rufous brown to earthy brown; supercilium faint, nearly obsolete; wings, wing-coverts and tail feathers slightly darker, the feathers edged rufescent or earthy brown; beneath whitish with a fulvous tinge; bill brown, fleshy at the base of the lower mandible; legs horn brown; irides yellowish.

Length.—5·25 to 5·5 inches, wings 2·25, tail 2·25, bill at front 0·55.

Hab.—According to Seebohm, this little warbler breeds in the valley of the Lower Volga, extending its range eastward in the Palæarctic region, at least as far as Turkistan, and probably to China. It also breeds in the Himalayas from Cashmere to Nepaul, and winters in the plains of India. Occurs as a migrant in Southern India, Sind, Deccan, Punjab, Beloochistan and Afghanistan.

Gen. **Lusciniola**, *Gray*; Phragamaticola, *Jerd.*

Lusciniola melanopogon, *Tem. Pl. Col.* pl. 2.45, fig. 2; *id. Man. d' Orn.* iii. p. 121; *Gray, List Gen.* p. 28; *Hume, Str. F.* 1873, p. 190; *Murray, Hdbk., Zool., &c., Sind*, p. 153; *Seebohm, Cat. B. Br. Mus.* p. 132; *Dresser, Birds Eur.* pt. lvi. Calamodyta melanopogon, *Tem. Gray, Handlist, B.* i. p. 210; *Shelley, B. Egypt*, p. 93. Calamodus melanopogon (*Tem.*) *Blf. East. Pers.* ii. p. 198.—The Moustached Grass Warbler.

A broad conspicuous white stripe from the nostrils over the eyes and ear coverts; a dark brown stripe from in front of, under, and through the eyes, enveloping the upper portion of the ear-coverts, darker in the males than in the females; the chin, throat and lower parts, including the lower tail-coverts white, faintly tinged rufescent on the breast, more strongly so on the flanks, about the vent, and in some specimens the lower tail-coverts also; the sides both of the neck and of the body tinged with greyish or in some olivaceous brown; forehead, crown, occiput, and nape very dark brown, the feathers tipped and margined a paler yellowish olive brown; in some specimens these tippings entirely obscure the base, except on a narrow line immediately above the white eye-streak; in others these parts appear to be very dark brown regularly striated with a pale olive brown, while in some the tippings are almost wanting; the back, scapulars, rump and upper tail-coverts, the same yellowish olive brown, becoming more rufescent on the lower back, rump and upper tail-coverts; the feathers of the centre of back with more or less conspicuous dark central shaft-streaks; in some birds the whole back seems regularly streaked with dark lines, in others only a few faint darker streaks are visible in the very centre of the back; in some again the lower back is much more decidedly rufous; the wings are hair brown; the primaries very narrowly margined and tipped on the outer web paler; the secondaries and tertiaries and most of the coverts more distinctly margined with a sort of rufescent

olive, the wing lining and axillaries pure or nearly pure white; tail feathers somewhat pale hair brown, obscurely margined with rufescent olive; the shafts dull white below. "The plumage," Mr. Hume says, "is rather variable, and in some specimens the flanks and tail-coverts are much browner than above described; the upper surface too varies a good deal in its general appearance * * * all the quills are margined on their inner webs albescent."

Dimensions from the fresh bird—sexes not differing appreciably in size.

Length.—5·7 to 5 8 inches, expanse 7·3 to 7·5, tail from vent 2 to 2·2, wing 2·4 to 2·5, wing when closed reach to within 1·25 to 1·4 of end of tail, bill at front 0·42 to 0·47, tarsus 0·82 to 0·87, hind toe and claw 0·55, claw only from root to point 0·3, weight 0·35 to 0·4 oz., irides brown to pale brown, feet dark horny grey, in some dusky brown, legs dusky brown, soles pale yellowish, bill very dark brown, almost black, paler on lower mandible.—*Hume, Stray Feathers*, vol. i., p. 191.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Persia and Afghanistan. A winter visitant.

Lusciniola neglectus, *Hume, Ibis*, 1870, p. 143; *Blf. East. Pers.* ii. p. 182; *Seebohm, Ibis.* 1877, p. 99; *Murray, Hdbk., Zool., &c., Sind.* Phyllopneuste neglectus, p. 619, (*Hume*) *Hume, Str. F.* i. p. 195. Lusciniola neglecta, *Seebohm, Ibis.* 1880, p. 277; *id. Cat. B. Br. Mus.* p. 131.—HUME'S GRASS WARBLER.

The following is Mr. Hume's description of the species:—

"The lores are brownish white; a comparatively pure and very narrow white streak runs from the nostrils over the lores and eyes, but not beyond. The whole upper surface is dull earthy brown, with, in some, a faintly olivaceous rufescent tinge on the back, most conspicuous on the rump; the quills and tail are a moderately dark hair brown, narrowly margined on the outer webs with pale olivaceous brown, much the same colour as the upper parts; the secondaries are very narrowly margined at the tips with albescent. The whole lower surface is albescent, tinged with very pale fulvous fawn, or earthy brown, more strongly so in some specimens than in others; the sides and flanks are pale earthy brown; the wing lining and axillaries are white, with at times the faintest possible fulvous or brownish tinge.

"*Length.*—4 to 4·2 inches, expanse 6·25 to 6·4, tail from vent 1·4 to 1·6, wing barely 2 to 2·15, bill at front 0·27 to 0·3, tarsus 0·68 to 0·71. The 4th primary, the longest, the 3rd and 5th a hair's breadth shorter, the 2nd 0·26 to 0·3, and the 1st 1 to 1·1 shorter than the 4th, the irides are brown, the legs and feet black, the bill black, paler or horny greenish in some at the base of the lower mandible."—*Str. F.* i. p. 196.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan and Persia. A winter visitant; chiefly affecting acacia groves.

Gen. **Cettia**, *Bp.*; Horeites, *Hodgs.*

Tail rounded, lateral tail feathers short; tarsi robust, scutellated in front.

Cettia cetti, *Marm. Mem. Acc. Tor.* xxx. p. 254; *Tem. Man. d' Orn.* i. p. 194; *Degl. Orn. Eur.* i. p. 578; *Seebohm, Cat. B. Br. Mus.* i. p. 135. Bradypterus cetti, (*Marm.*) *Shelley, B. Egypt*, p. 89; *Dresser, Ibis.* 1876, p. 89. Cettia cetioides, *Hume, Str. F.* i. p. 194. Cettia stolickzæ. *Hume, Str. F.* ii. p. 520. Cettia sericea, *Natt. fide Tem. Man. d' Orn.* i. p. 197; *Murray, Hdbk., Zool., &c., Sind*, p. 155.—CETTIS' BUSH WARBLER.

"A spot in front of the eyes dusky; a streak from the nostrils over the eye and a circle round the eye fulvous white; the forehead, crown, and whole upper surface a warm rufous or ferruginous brown, more rufous on the rump and upper tail-coverts; the quills and tail hair brown, magined with rufescent olive; ear-coverts, sides of the neck, body, flanks and vent feathers a pale dull greyish or earthy brown; chin, throat, breast, and abdomen white, lower tail-coverts slightly rufous brown (webs very lax and much disunited) narrowly tipped with white; axillaries and wing lining slightly greyish white; the edge of the wing just above the base of the primaries is white; in some few specimens, the eye streak extends beyond the eye, above more than half of the ear-coverts, but in most it ceases just beyond the posterior angle of the eye; irides brown; legs and feet pale brown or fleshy brown, darker on toes and claw; bill dark horny brown, but paler on lower mandible.

"*Length.*—5·8 to 6·5 inches, expanse 7·5 to 8·4, tail from vent 2·4 to 3, wing 2·5 to 2·8, wings, when closed, reach to within from 1·2 to 2 of end of tail; bill at front 0·4 to 0·5, tarsus 0·8 to nearly 0·9, weight 0·4 oz."—*Stray Feathers*, vol. i. p. 191.

Mr. Hume gives an interesting account of its skulking habits among the almost impenetrable rushes.

Hab.—Sind, Beloochistan, Persia, and Afghanistan. Found in France, Spain, Algeria, Greece, Asia Minor, Palestine and Turkistan.

Sub-Family, DRYMOICINÆ,—WREN WARBLERS.

Bill moderately long, compressed; wings short, rounded; tail long.

Gen. **Orthotomus.**—*Horsf.*

Bill slender, basally wide; rictal bristles few; 5th and 6th quills of wing longest and equal; tail narrow, short and rounded.

Orthotomus longicauda, *Gmel., Mag. de Zool.* 1836, t. 52·53; *Murray, Hdbk., Zool., &c., Sind*, p. 163; *Jerd. B. of Ind.* ii. p. 165, No. 530. Orthotomus sphenurus, *Sws. C. of B.* f. 135; *Gray, Gen. B.* i. p. 161, pl. 48, f. 1.

Forehead and crown rufous; back of head and neck ashy with a very faint rufous tinge; sides of nape with two dark brown setæ on each side; back, scapulars, rump and upper tail-coverts yellowish green; edge of wing white; primaries and secondaries brown, edged with olive green, more distinct on the secondaries; all, for two-thirds their length, narrowly margined basally on the inner webs with whitish; under

wing-coverts buffy white; tail light brown, the central feathers greenish, and the lateral ones edged on the outer web with the same and tipped with white; chin, throat, breast, belly and under tail-coverts white; the flanks cinereous; a dark spot on each side of the throat; bill horny brown, paler on the under mandible; legs brown; irides reddish yellow.

Length.—6 to 6·5 inches, wing 1·9 to 2, tail 3·5, bill at front 0·5.

Hab.—Throughout India to Nepaul and Cashmere, Ceylon and British Burmah. Common in the Deccan, Concan, Kutch, Kattiawar and North Guzerat, also the Punjab, N. W. Provinces, Oudh, Bengal, and Central India. In Sind it is common in all the open country studded with trees, and affects the acacias chiefly. Breeds in July and August. Eggs 2 to 4, white, spotted with reddish brown, thicker and closer at the larger end. Nest made of leaves, stitched with cotton or fibre, and lined with wool and cotton.

Gen. **Prinia.**—*Horsf.*

Characters same as those of *Orthotomus*, but with the rictal bristles distinct; tail more lengthened and graduated; and the toes and claws longer.

Prinia flaviventris, *Deless.*; *Gray, Gen. B.* i. p. 162, pl. 48; *id. Handlist, B. Br. Mus.* p. 196, *Jerd. B. India*, ii. p. 169; *Str. F.* 1880, p. 386.—The Yellow-bellied Wren Warbler.

Forehead, crown, nape, lores and ear-coverts dark ashy; back and upper tail-coverts olive green; quills dusky brown, margined on their outer webs with olive green; chin, throat and breast white; belly vent and under tail-coverts bright yellow; bill dark brown, the under mandible paler; legs yellowish; irides reddish yellow.

Length.—5 to 5·25 inches, wing 1·75 to 2, tail 3, bill at front 0·5.

Hab.—India generally, to Assam, Sylhet, Burmah and Nepaul. Not found in Southern India. Breeds in Sind from June to September.

Gen. **Cisticola.**—*Kaup.*

Bill short, slender; wings short; 3rd, 4th and 5th quills equal and longest; tail of 12 feathers, rather short.

Cisticola schœnicola, *Bp.*; *P. C.* 6·3; *Gould. B. Eur.* pl. 113; *Jerd. B. Ind.* ii. p. 174, No. 539; *Murray, Hdbk., Zool., &c., Sind*, p. 156. Cisticola cursitans, *Frankl. P. Z. S.* 1831; *Jerd. Ill. Ind. Orn.* pl. 6; *Str. F.* i. p. 439; iii. pp. 137, 397; v. p. 90; vi. p. 349.—The Rufous Grass Warbler.

Forehead rufescent; crown, hind neck and back dark brown, all the feathers margined and edged with rufous; rump and upper tail-coverts rufous; primaries and secondaries dusky brown, edged on their outer webs with pale rufous; tertiaries dark brown, edged and tipped with pale rufous; edging near the tips and the tips whitish; tail dusky brown above, pale brown below, the feathers with a broad subterminal band of black, tipped with white; the dark spots and white tips more

distinct on the under surface; chin and throat whitish or rufescent white; breast and belly rufescent; vent and under tail-coverts paler; bill dusky brown; the under mandible paler; irides brownish.

Length.—4·5 to 4·75 inches, wings 2 to 2·25, tail 1·75 to 2, bill at front 0·25.

Hab.—India generally to Nepaul; British Burmah, S. W. Europe, Africa, Egypt, Arabia, Deccan, Concan, Kutch, Kattiawar, Jodhpore, and N. Guzerat, also Bengal and Central India.

In Sind it affects the tamarisk jungles along the banks of the Indus, and breeds in July and August.

Gen. **Drymoipus**.—*Bp.*

Bill slender, shorter than in *Prinia*; vibrissæ more developed; wings short, rounded; 4th and 5th quills longest; tarsi long.

Drymoipus inornata, *Sykes; Fras. Zool. typ.* pl.; *Jerd. B. Ind.* ii. p. 178, No. 543; *Str. F.* vol. iii. 295, 483; iv. 229, 407; vii. 468; *Murray, Zool., &c., Sind*, p. 157. Drymoipus longicaudatus, *Tick.*—The Common Wren Warbler.

Forehead, crown, and hind neck grey brown with a faint olivaceous tinge; lores and supercilium whitish; back grey brown, as are also the scapulars, rump and upper tail-coverts; quills brown, edged with pale rufous on the outer web, and whitish on the margin of the inner web for the basal two-thirds; wing-coverts brown; tail rufescent brown, the centre feathers obsoletely barred, and the lateral ones, with a terminal dark spot; chin and throat whitish, rest of under surface whitish, with a buffy or fulvescent tinge, deeper on the flanks; thigh-coverts pale ferruginous or rufescent brown; bill and legs horny brown, the lower mandible paler; irides yellowish.

Length.—5 to 5·5 inches, wing 1·75 to 2, tail 2·75, bill at front 0·5.

Hab.—India to Nepaul. Occurs in the Deccan, Jeypore, Jodhpore, Sambhur, Kutch, Kattiawar and N. Guzerat. Resident in Sind; breeds in July and August. Nest globular, made of fibrous materials, lined with wool or cotton; eggs 2 to 4, of a beautiful blue colour, with large spots of reddish, purplish, or dark red brown.

Gen. **Blanfordius**.—*Hume.*

Allied to *Suya*. Tail of 12 feathers; wings, with the 5th, 6th and 7th quills equal and longest; 4th equal to 8th; 3rd nearly equal to 9th.

Blanfordius striatulus, *Hume, Str. F.* i. p 300; *Murray, Hdbk., Zool., &c., Sind*, p. 157.

An obscure rufous white streak from the nostrils to the upper part of the eye. The whole upper parts dull greyish olive brown (the grey preponderating on the head) all the feathers except those of the upper tail-coverts conspicuously centred with dark brown; wings pale hair brown, all the feathers margined with pale rufescent olive; tail feathers a sort of olive brown, the feathers conspicuously darker, very stiff looking, and with glistening shafts, all the feathers obsoletely transversely

rayed, the central ones most strongly so. All but the central ones narrowly tipped fulvous white, and with an obscure subterminal dark band; on the under surface, the shafts are white; the ear-coverts mingled fulvous and pale rufous brown; the sides of the neck streaked like the back; on either side of the throat descends from the gape, for about half an inch, a band of tiny white feathers, with minute dark centres, so as to produce the appearance of two or three regular rows of little spots on each side of the throat; the chin and the centre of the throat, breast and abdomen white, tinged buffy on the two latter, and with all the feathers of the throat and breast very faintly and narrowly tipped with brown, so as to produce the appearance of a number of narrow, faint, transverse bars. The flanks, sides, vent and lower tail-coverts are tinged with dull olive brown mingled with fulvous buff; the wing lining is buffy white, and so are the inner margins of the inner webs of the quills as seen from below.

Length.—(Of the dry skin; female) about six inches, wing 1·9, tail from vent 2·75, bill at front about 0·45, tarsus 0·7, tail from vent 2·75, legs and feet fleshy, bill brown, pale fleshy on lower mandible.—(*Hume, S. F.* i. p. 300.)

Hab.—Sind (Kurrachee).

Gen. **Burnesia.**—*Blyth.*

Bill very slender; vibrissæ minute; tail as in the last; tarsi long; other characters as in *Drymoipus*.

Burnesia gracilis, *Rupp. Atl.* t. 2.6; *P. C.* 466, 1.; *Str. F.* vol. v. p. 496. Burnesia lepida, *Blyth, J. A. S. B.* xiii. 376; xvi. 460; *Gould. B. Asia.* pl. *Jerd. B. Ind.* ii. p. 185, No. 550; *Murray, Hdbk., Zool., &c., Sind*, p. 158.—The Streaked Ween Warbler.

Head, back, scapulars and upper tail-coverts light olive grey, each feather mesially streaked with dusky brown; quills dusky brown, the feathers margined on their outer webs with the colour of the back; lores and supercilium whitish; tail olive grey, the feathers with distinct, but obsolete transverse dusky bars, a subterminal dark spot on the inner web of each feather and tipped white; chin, throat, breast, belly and vent greyish white; bill dusky brown; the lower mandible pale fleshy; irides yellowish brown.

Length.—5·25 to 5·5 inches, wing 1·75, tail 2·5, bill at front nearly 0·5.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan and Persia; also Bengal, Deccan, Kutch, Kattiawar, Jeypore, Jodhpore and North Guzerat. As in most parts of Western India, it is a resident in Sind, breeding from May to July.

Gen. **Scotocerca.**

Scotocerca inquieta, *Rupp. Syst. Uebers.* p. 56; *Heugl. Ibis*, 1869, p. 129; *id. Orn. N. O. Afr.* i. p. 244; *Sund. Meth. Nat. Av. Tent.* p. 7; *Blf. Ibis*, 1874; *id. East. Persia* ii. p. 207, pl. xiii. f. 2; *Str. F.* i. 200; ii. 329; *Murray, Hdbk., Zool., &c., Sind*, p. 159. Malurus inquietus, *Rupp. Atl. Reise. N. Afr. Aves.* p. 55. Curruca famula, *Hemp.*

et Ehr. Symb. Phys. Aves. fol. b. b. Melizophilus striatus, *Brooks, Proc. A. S. B.* 1872, p. 66; *id. Ibis*, 1872, p. 180; *Hume, Str. F.* i. p. 200.—RUPPEL'S WREN WARBLER.

Above light brownish grey, with narrow dark brown streaks on the head as far as the shoulders; a broad pale rufous-brown supercilium; the cheeks and ear-coverts are also of this colour, which extends down the sides of the neck and breast, becoming very pale and diluted under the wings, and on the flanks; wings light brown, the edges of quills and coverts greyish; tail a very much darker or rather blackish brown, the outer feather on each side is rather lighter, and is tipped with white; the tail feathers are cross rayed, particularly the outer ones.

Lower surface of body, except sides of neck, breast, and flanks, white, with narrow brown streaks from chin to upper breast. These streaks are well defined in one specimen, and faint in another. Lining of wing and edge of the same, reddish white. Bill dark brown, except basal half of lower mandible, which is dull brownish orange; legs and feet yellowish brown; claws brown.

Length.—4·55 to 4·8 inches, wing 1·93 to 1·95, tail 2·14 to 2·33, tarsus ·77 to ·82, bill at front ·35, from gape ·46. The bill is excessively like that of *Melizophilus provincialis*, the wing also resembles that bird, except that the first primary is larger in proportion. Tail of similar form, but proportionately shorter; the outer feathers are ·35 shorter than the central ones; *length* 4·7, expanse 6·2, tail from vent 2, wing 1·9, wings, when closed, reach to within 1·6 of end of tail, bill at front 0·35, tarsus 0·8, weight 0·3 of an oz. (*Brooks*) *Ex Str. F.* i. p. 200.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, S. E. Persia, S. Afghanistan.

Gen. **Franklinia.**—*Blyth.*

Bill stout, compressed; wings short; tail broad, lengthened and graduated.

Franklinia buchanani, *Blyth, J. A. S. B.* xiii. p. 376; *Jerd. B. Ind.* ii. p. 186, No. 551; *Murray, Hdbk., Zool., &c., Sind*, p. 159.—THE RUFOUS-FRONTED WREN WARBLER.

Forehead and crown pale rufous; back, scapulars, wings, rump and upper tail-coverts greenish ashy; tail brown, all the feathers except the two central ones broadly tipped with white; chin, throat, breast, belly, vent and under tail-coverts white; bill brown; lower mandible yellowish; legs dusky; irides orange.

Length.—5 to 5·25 inches, wing 2 to 2·25, tail 2 to 2·25.

Hab.—Western India; Sind, Punjab, N. W. Provinces, Oudh, Central and South India, Deccan, Kutch, Kattiawar, Jeypore, Jodhpore, and North Guzerat. Breeds from May to August.

Sub-Family, PHYLLOSCOPINÆ,—TREE WARBLERS.

Bill depressed at base; rictal bristles well developed; wing long, flat, pointed; bastard primary small; tail even or forked, or rounded.

Gen. **Hypolais**, *Brehm.*; Iduna, *Bp.*; Jerdonia, *Hume.*

Bill slender, wide basally; rictal bristles few. Wings moderate. Bastard primary extending beyond or shorter than the primary coverts; 3rd and 4th quills longest. Tail even or rounded.

Hypolais pallida, *Hemp. et Ehr. Symb. Phys. Aves.* fol. b. b. Hypolais pallida (*Ehr.*) *Dubois, Ois. Eur.* pl. 71.; *Dresser, B. Eur.* pt. xxxi.; *Blf. East. Pers.* ii. p. 187; *Hume, Str. F.* vol. vii. pp. 398, 504; *Murray, Hdbk., Zool., &c., Sind*, p. 160; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 82. Hypolais elæica, (*Lindern*) *Gerbe, Rev. Zool.* 1844, p. 440; *Heugl. Orn. N. O. Afr.* i. p. 297; *Blanf. Geol. and Zool. Abyssinia*, p. 380; *Sharpe, Cat. Afr. B.* p. 33; *Shelley, B. Egypt*, p. 100.—The Olivaceous Tree Warbler.

Adult Male.—Upper parts pale dull olive brown, clearer on the back in colour, and rather lighter on the rump; from the base of the bill over the eye a rather indistinct yellowish stripe; wings dark brown; the inner secondaries lighter in colour, all the feathers having lighter margins; tail dark brown, very narrowly edged with lighter brown; under parts buffy white; the throat and the centre of the abdomen almost pure white; flanks washed with pale brownish; bill horn brown, dull yellowish at the base of the lower mandible; legs pale horn brown; iris dark brown.

Length.—About 5 inches, culmen 0·62, wing 2·63, the first primary extending 0·27 beyond the wing-coverts and 1·15 shorter than the 2nd, 2nd 0·2 shorter than the 3rd, 3rd and 4th equal, tail 2·2, tarsus 0·83.—(*Dresser, Birds Europe*) *ex S. F.* vol. vii. p. 398.

Hab.—Europe, Africa, Greece, Constantinople, Palestine, Egypt; Sind, Beloochistan, Persia, S. Afghanistan, Turkistan. This species and the next two (*caligata* and *rama*) are winter visitants in Sind, and affect the same situations. All appear to be varieties of *Hypolais languida*, a species found in S. E. Persia, at Quetta in Beloochistan, (Chaman) S. Afghanistan, and probably also in Sind. Mr. Seebohm, grouping *H. opaca, pallida, rama, caligata* and *obsoleta*, says, that an unbroken series may be found from the largest *opaca* from Spain, through the smaller, *H. pallida* from Greece and Asia Minor, and the still smaller *H. pallida* and *H. rama* from Persia down to the small skins of *H. rama* from India, and the still smaller *H. caligata* from Turkistan and India. Skins from Sind of these three last do not appear to have been in the British Museum collection. In reference to *H. pallida*, comparing Indian skins, Mr. Hume observes (*Str. F.* vol. vii. pp. 396, 398) that it is very close to *rama*, but is somewhat larger, with a longer and decidedly larger bill; and that the two forms, *rama* and *pallida*, quite run into each other, many of the Sind and Beloochistan specimens being quite intermediate. There does not appear to be any very appreciable difference in colour in the series I possess of these species from Sind, Beloochistan, Afghanistan and the Deccan, except the seasonal abrasion of feathers; this is also remarked by Mr. Seebohm. *H. languida*, he says, has apparently only just succeeded in isolating itself, and adds that he is not sure whether in a large series of the

species intermediate forms might not occur between it and *H. pallida*. I extract the following key to the species from Mr. Seebohm's *Cat. B. Br. Mus.* vol. v. p. 76.

A. General colour of the upper parts brown or grey; under parts white or pale brown; outside tail feathers 0·15 to 0·2 inch shorter than the longest.

(*a*) 2nd primary intermediate between the 5th and 6th, bastard primary following short of the primary coverts by 0·1 inch, or extending 0·05 beyond them. Length of wing 3·05 to 2·8 inches .....*H. languida*.

B. Bastard primary exceeding the primary coverts by at least 0·1 inch.

(*a*) General colour of the upper parts pale sandy brown or isabelline brown .....*H. obsoleta*.

C. General colour of the upper parts darkish rufous brown or grey.

(*a*) 2nd primary generally intermediate between the 5th and 6th; bastard primary exceeding the primary coverts from 0·1 to 0·3 inches. Length of wing 2·75 to 2·5 inches; culmen 0·7 to 0·6.....*H. pallida*.

(*b*) 2nd primary generally intermediate between the 7th and 8th, or 8th and 9th; bastard primary exceeding the primary coverts from 0·2 to 0·4 inch. Length of wing 2 53 to 2·3 inches; culmen 0·6 to 0·53 .....*H. rama*.

(*c*) 2nd primary generally intermediate between 6th and 7th; bastard primary exceeding the primary coverts 0·15 to 0·26. Length of wing 2·38 to 2·28 inches; culmen 0·51 to 0·5 .....*H. caligata*.

Hypolais rama, *Sykes, P. Z. S.* 1832, p. 89; *Blf. East. Pers.* ii. p. 187; *Hume, Str. F.* vol. vii. 183, 396; *Murray, Hdbk., Zool., &c., Sind*, p. 160; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 84. Phyllopneuste rama, (*Sykes*) *Jerd. B. Ind.* ii. p. 189, No. 553.—Sykes' Tree Warbler.

Seebohm (*Cat. B. Br. Mus.*) describes this as "a shade darker in colour both above and below, than typical, *H. pallida*. It is on an average a somewhat smaller bird, with a shorter second primary and a longer bastard primary. The 3rd, 4th and 5th primaries are nearly equal and longest; the second is usually intermediate in length between the 7th and 8th, and not unfrequently between the 8th and 9th, and in rare instances between the 6th and 7th. The bastard primary exceeds the primary coverts by 0·2 to 0·4 inch."

Length.—Of wing 2·53 to 2·3 inches, tail 2·25 to 1·9, culmen 0·6 to 0·53, tarsus 0·85 to 0·8, outside tail feathers 0·25 to 0·15 inch shorter than longest. After the autumn month the under parts are somewhat more suffused with pale buffish brown than appears to be the case after the spring month; otherwise, I can discover no differences attributable to age, sex or season, beyond the usual wear and tear of abrasion.

Hab.—Sind, Beloochistan, S. E. Persia, Afghanistan, East Turkistan, Punjab, N. W. Provinces, Oudh, Cashmere, Kutch, Kattiawar, N. Guzerat, Jodhpore, Concan, Deccan and South India.

Hypolais caligata, *Licht. Eversm. Reis. Buchara,* p. 128; *Degl. et Gerbe. Orn. Eur.* i. p. 510; *Dresser, B. Eur.* pt. xxxviii. 1875; *Dresser, Ibis,* 1876, p. 88; *Murray, Hdbk., Zool, &c., Sind,* p. 160; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 86. Phyllopneuste rama, (*Sykes*) *apud. Jerd. B. Ind.* vol. ii. p. 189 (*partim*). Jerdonia agricolensis, *Hume, Ibis,* 1870, p. 182. Calamodyta agricolensis (*Hume*) *Tristram, Ibis,* 1870, p. 494. Salicaria microptera, *Severtz. Str. F.* iii. p. 425; *id.* vii. p. 397.—The Booted Tree Warbler.

Male.—Head, hind neck, back, scapulars, ear-coverts and sides of the neck a greyish brown. Supercilium, extending from the base of the bill to the ear-coverts, whitish buff; rump and upper tail coverts brownish, the feathers of the rump tinged very slightly with a shade of rufescent. Wings concolorous with the tail; their coverts as well as the primaries, secondaries and tertiaries margined with rufescent brown, in some specimens greyish white, more broadly on the tertiaries and wing-coverts. Edge of wing and under wing and thigh-coverts pale buffish white; tail brown, the feathers narrowly margined with greyish white, fulvescent in some specimens; the outer web of the outermost feather on each side greyish or fulvous white, the others, except the centre feathers, tipped greyish white or fulvous. Under surface pale buffy white, albescent on the chin, belly and lower tail-coverts, and tinged brownish on the flanks. Bill dark brown; the lower mandible pale fleshy, dusky near the tip; legs and feet fleshy or pale brownish yellow; irides brown.

Length.—4·5 to 5 inches, wing 2·2 to 2 38, tail from vent 1·95 to 2, bill at front ·35, tarsus ·8.

Hab.—India to Nepaul and Cashmere; Sind, Punjab, N. W. Provinces, Deccan, Concan, Khandeish, Behar and Madras; wintering in the plains of India and breeding in Cashmere, Turkistan and Southern Siberia.

Hypolais obsoleta, (*Severtz.*) *Seebohm. Cat. B. Br. Mus.* vol. v. p. 86. Salicaria obsoleta, *Severtz. Turkest. Jevotn.* pp. 66, 129; *Dresser, Ibis,* 1876, p. 87.—The Desert Tree Warbler.

The following is Mr. Seebohm's description of this species:—"The general colour of the upper parts is a sandy brown or pale isabelline brown. In other respects the colouration is the same as that of the two or three preceding sub-species; 3rd and 4th primaries nearly equal and longest; 2nd primary, in a skin from Turkistan intermediate in length between the 6th and 7th, and in one from Sind between the 7th and 8th; the bastard primary exceeds the primary coverts by 0·35 inch in both skins.

Length.—Of wing 2·4 inches, tail 2·0, culmen in the Turkistan skin 0·51, in the Sind skin 0·8, darkish brown." The colour of the soft parts are not given. This has been included on Mr. Seebohm's authority, who says he has a skin from Sind, as well as from Turkistan.

Comparing my small series, I cannot find any to agree with the colouration as above.

Hab.—Turkistan; wintering in Sind.

Gen. **Phylloscopus**, *Boie, Syn.* Ficedula, *Koch.* Phyllopneuste, *Meyer.* Trochilus, *Forst.*

Bill slender, small, straight; rictal bristles few, short, distinct; wings with the bastard primary small.

Phylloscopus tristis, *Blyth, J. A. S. B.* xii. p. 966; xiv. p. 59; *Jerd. B. Ind.* ii. p. 190, No. 554; *Dresser, B. Eur.* pt. lxvi. 1875; *Blf. East. Pers.* ii. p. 180; *Scully, Str. F.* iv. p. 148; *Seebohm, Ibis,* 1877, p. 97; 1879, p. 10; *id. Cat. B. Br. Mus.* vol. v. 63; *Murray, Hdbk., Zool., &c., Sind,* p. 161. Phyllopneuste tristis, (*Blyth*) *Gould. B. Asia,* pt. xvii. Phylloscopus brehmi, *Hom. apud. Blf. East. Persia,* ii. p. 182.

Above dull earthy brown, with an olive green tinge on the lower back and rump; lores and behind the eye and ear-coverts like the back; supercilium pale buffy white; wings brown, their coverts with pale margins, and the primaries and secondaries edged on their outer webs with greenish; edge of wing and under wing-coverts yellow; tail brown, the feathers edged on their outer webs with yellowish green; the inner web faintly and narrowly margined with whitish; under surface albescent; bill dark brown; legs blackish; irides brown.

Length.—5 inches, wing 2·5, tail 2 to 2·3.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal; Beloochistan, S. E. Persia, Afghanistan and East Turkistan; Deccan, Kutch, Kattiawar, Jeypore, Jodhpore, and North Guzerat. In Sind, as in other parts of India, it is a winter visitant.

Phylloscopus nitidus, *Blyth, J. A. S. B.* xii. p. 965; xiv. p. 591; *Jerd. B. Ind.* ii. p. 193, No. 559; *Hume, Str. F.* 1873, p. 197; *Legge, Ibis,* 1874, p. 22; *Seebohm, Ibis,* 1877, p. 72; *id. Cat. B. Br. Mus.* vol. v. p. 43; *Murray, Hdbk., Zool., &c., Sind,* p. 162. Phyllopneuste nitida, (*Blyth*) *Adam, Str. F.* 1873, p. 382.—The Green Willow Warbler.

Head, nape, back, scapulars, rump and upper tail-coverts yellowish green; supercilium extending to the nape yellow; lesser wing-coverts and tips and edges of the median ones like the back; greater wing-coverts brown, edged with yellowish green, and tipped yellow, forming a conspicuous wing band; primaries, their coverts and secondaries brown, edged on their outer webs with yellowish green; edge of the wing, under wing-coverts and entire under surface yellow, in some specimens albescent on the chin; bill dusky brown; the lower mandible pale; legs light brown; irides dark brown.

Length.—4·5 to 4·75 inches, wing 2·5, bill at front 0·5.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Concan, Deccan, Southern India, Ceylon, and Nepaul; breeding in the Himalayas and wintering in the plains.

Phylloscopus sindianus, *Brooks, Str. F.* vol. viii. p. 476.

"Above uniform dull brown, rather lighter than in *P. tristis*, and much the colour of the upper surface of *Hypolais rama*; below albescent, with a ruddy tinge on the pale supercilia, sides of face, neck, breast, and flanks; axillaries and edge of wing yellowish white, sometimes almost quite white, and not pure sulphur yellow as in *P. tristis*; no greenish on bend or shoulder of wing, nor any green edging to the primaries, secondaries and tail feathers generally observable in *P. tristis*; no greenish tinge on rump; like *P. neglectus* and *H. rama*, the uniform light greyish brown upper surface is characteristic; bill *Phylloscopine*, like *tristis*, dark brown; the base of lower mandible yellowish."

	Male.	Female.
Length.—	4·40 to 4·70	4·20 to 4·45.
Wing.	2·22 to 2· 4	2·05 to 2·15.
Tail.	1·85 to 2·05	1·75 to 1· 9.
Bill at front	·3 to ·35.	

Hab.—Sukkur, Sind.

Gen. **Reguloides**.—*Blyth.*

Characters same as those of *Phylloscopus*; wings moderately long and pointed; 2nd primary shorter than 4th.

Reguloides occipitalis, *Jerd. B. Ind.* ii. p. 196, No. 563; *Brooks, Ibis*, 1869, p. 457; 1872, p. 29; *Hume, Nest and Eggs, Ind. B.* p. 362; *Murray, Hdbk., Zool., &c., Sind*, p. 162. Phylloscopus occipitalis, (*Blyth*) *fide, Seebohm, Cat. B. Br. Mus.* vol. v. p. 50.—JERDON'S LARGE-CROWNED WILLOW WARBLER.

Male.—Forehead, interspace between the supercilium and mesial yellow streak on the crown, brown, with a dull greenish tinge; rest of the upper parts dull olive green, brighter on the rump and upper tail-coverts; supercilium buffy or yellowish white, extending to the nape; a yellowish mesial line from the forehead to the nape; wing-coverts olive green, the median and greater coverts with greyish or yellowish white tips, forming two conspicuous bars; primaries and secondaries brown, margined on their outer webs with the colour of the back, and tipped with greyish white; edge of the wing and under wing and thigh-coverts pale yellow; tail brown, the feathers margined yellowish green on their outer webs, and all, except the two median ones, margined narrowly with greyish white on their inner webs; chin, throat, breast, abdomen and under tail-coverts greyish white with a very slight tinge of yellowish on the breast and under tail-coverts; in some pure greyish white, (probably the summer plumage) with the wing bands nearly absent, or indistinct; bill dusky brown; the base of the lower mandible yellowish; legs pale brown; irides hazel.

Length.—4·75 to 5, wing 2·5 to 2·75, tail 2·0 to 2·15, bill at front 0·5.

Hab.—Sind, the Punjab (at Montgomery), N. W. Provinces, Oudh, Bengal, Central India, Raipur, N. W. Himalayas, Nepaul, Cashmere, and Southern India.

Sub-Family, SYLVIINÆ,—Grey Warblers.

Bill moderately slender, with few rictal bristles at base; nostrils in a groove; wings—first quill short, 2nd shorter than 3rd and 4th, which are equal or sub-equal; tarsi moderate, scutellate.

Gen. **Sylvia**, *Lath.*; Curruca, *Koch.*

Characters same as those of the Sub-Family. Outermost tail feathers generally white.

Sylvia jerdoni, *Blyth, J. A. S. B.* xvi. p. 439; *Blf. East. Persia*, ii. p. 172; *Hume, Str. F.* i. p. 197, ii. 330; *Seebohm, Monog. B. Br. Mus.* p. 16.—The Eastern Orphean Warbler.

Adult Male.—General colour slaty grey; head, lores, and feathers behind the eye, ear-coverts and nape sooty black; primaries and secondaries brown, their outer margins whitish; the secondaries edged at the tips with greyish white, as also some of the tertiaries; tail darker brown than the wings, the outermost feathers white on the outer web, and nearly one-half of the inner, the next two tipped white; in some specimens the centre feathers are margined very narrowly and tipped with fulvescent white; chin and throat white; belly, flanks, vent and under tail-coverts greyish white, darker on the under tail-coverts; bill dark brown; the base of the lower mandible pale yellowish; legs and feet dusky brown; irides hazel.

Length.—6·75 to 7 inches, wing 3 to 3·25, tail 2·75. The *Female* differs from the male in having the brown of the head less darker than the back.

Hab.—Northern and Western India, Sind, Punjab, N. W. Provinces, Beloochistan, S. E. Persia, Afghanistan, Turkistan, Kutch, Kattiawar; Jodhpore, Jeypore, North Guzerat, Mount Aboo and Deccan. Breeds in Persia and Turkistan; winters in Arabia and the plains of India.

Sylvia affinis, *Blyth, Cat. B. Mus. As. Soc.* p. 187; *Hume, Str. F.* vii. p. 60; i. 197; ii. 332; iii. 272; *Jerd. B. Ind.* ii. 209, No. 582; *Murray, Hdbk., Zool., &c. Sind*, p. 163. Sylvia curruca, *apud. Jerd. B. Ind.* ii. p. 209; *apud. Blf. East. Persia*, ii. p. 175.—The Allied Grey Warbler.

General colour pale slaty or brownish grey; supercilium indistinct; wings and tail brownish; outermost tail feather on each side white on their outer webs; chin, throat, belly, and under tail-coverts, also axillaries and under wing-coverts white, tinged greyish brown on the breast and flanks; bill and legs brown; irides light brown.

Length.—6 inches, wing 2·5, tail 2·25, bill at front 0·51.

Hab.—Nearly all India and Ceylon, Sind, Punjab, N. W. Provinces, Behar, Deccan, Kutch, Guzerat, Kattiawar, Jodhpore and Sambhur; also Beloochistan, Persia, S. Afghanistan and Turkistan.

Sylvia minuscula, *Hume, Str. F.* i. 198; vii. 58 *et seq.*; viii. 103, 388, 498; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 20, pl. 1.—Hume's Lesser White-Throat.

Forehead and crown pale bluish grey; back, rump and upper tail-coverts isabelline fawn, or pale sandy brown; chin, throat and under surface white; 2nd primary equal to the seventh, in some intermediate between 7th and 8th; wing 2·3 to 2·45.

Hab.—Sind, Beloochistan, Afghanistan, Punjab, N. W. Provinces, Rajputana, Kutch and Guzerat.

Sylvia althea, *Hume, Str. F.* vii. p. 60; *Seebohm, Cat. B. Br. Mus.* vol. v. p. 20; Sylvia affinis, *apud. Jerd. B. Ind.* vol. ii. p. 209; *apud. Legge. B. Ceylon*, p. 538.—The Himalayan Lesser White-Throat.

Upper surface darkish grey, slightly tinged with brown on the back. Under surface white; 2nd primary intermediate in length between, or equal to 6th and 7th, or 7th and 8th; wing 2·7 to 2·8; culmen 0·56 to 0·51; tarsus 0·8 to 0·75.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Deesa, Concan and Deccan. A winter visitant.

Sylvia cinerea, *Bechst. Orn. Taschenb.* i. p. 170; *Tem. Man. d'Orn.* p. 112; *Gray, Gen. B.* i. p. 174; *Heugl. Orn. N. O. Afr.* i. p. 307; *Blf. Geol. and Zool. Abyss.* p. 379; *Shelley, B. Egypt*, p. 111. Curruca cinerea (*Bechst.*) *Gould. B. Eur.* ii. pl. 125. Sylvia rufa, (*Bodd.*) *Pl. E.* p. 35; *apud. Newt. ed. Yarr. B. Eur.* pt. 1; *Hume, Str. F.* iii. 488; *Murray, Hdbk., Zool., &c., Sind*, p. 163.—The European White-Throat.

"*Male.*—Over the eye is a streak of yellowish white. Head on the crown slate grey with a tinge of brown; neck on the sides pale brownish grey; on the back and nape, lighter greyish brown than the head; chin and throat silvery white, the latter has the feathers somewhat puffed out as when it is inflated in singing; breast above pale dull white, tinged with rose colour, and on the sides shaded off to yellowish white, and into greyish white below; back reddish brown, but tinged with olive on its lower part. The wings extend to within an inch and a half of the end of the tail. Expanse 8½ inches. The first primary extremely short; the 2nd and 3rd of equal length and the longest; edge of outer quill white; underneath grey; greater and lesser wing-coverts reddish brown; primaries pale brown, narrowly edged with chestnut; the secondaries and tertiaries also pale brown, broadly edged with brighter chestnut than the former; tail somewhat rounded and graduated and brown; middle feathers margined lighter; outer feather on each side dull white over the greater portion or the whole of outer web, and often a portion of the inner; next two feathers tipped with the same. Tail underneath grey; upper tail-coverts inclining to olive brown; under tail-coverts pale brownish white, with a tinge of faint rose red; leg pale rusty brown; toes darker with more of an olive tinge; claws dusky brown.

"*Length.*—5½ to 6 inches, bill bluish brown, base of under mandible yellowish brown, and the corners of the mouth yellowish green. Iris brownish yellow. A winter visitant."—*Morris, Br. Bird*, vol. iii. p. 227.

Hab.—Europe, extending to Persia, Siberia and Turkistan; Sind, Punjab, N. W. Provinces, Bengal, Guzerat, Western, Central and Southern Africa.

Sylvia nana. *Hempr. et Ehr. Symb. Phys. Aves*, fol. c. c.; *Gray, Handlist B.* p. 212; *Heugl. Orn. N. O. Afr.* i. p. 306; *Dresser, Ibis*, 1876, p. 80; *Blf. East. Pers.* ii. p. 187; *Str. F.* i. 199; ii. 330; *Murray, Hdbk., Zool., &c., Sind*, p. 164; *Seebohm, Cat. B. Br. Mus.* vol. v. p.26. Sylvia delicatula, *Hartlaub. Ibis*, 1859, p. 340, pl. x. fig. i.; *Blyth, Ibis*, 1867, p. 28; *Hume, Ibis*, 1869, p. 355; *Str. F.* i. p. 199.—THE DESERT WARBLER.

"The lores are greyish white; from the nostrils to the upper margin of the eye runs a very narrow yellowish streak, whiter and less grey than the lores; this line ceases to be visible in nine out of ten skins, but is sufficiently apparent in the freshly killed bird. A circle of yellowish white feathers surrounds the eye; forehead, crown, occiput, nape, back and scapulars pale fawn brown; rump and upper tail-coverts pale rufous; central tail feathers pale rufous, with dark shafts; external lateral feathers wholly white; next pair white on the outer webs, and with a moderately broad white tip to both webs, the rest of the inner webs dark hair brown; the rest of the feathers dark hair brown, margined on the outer webs with pale rufous. The whole of the lower parts white, with, in the freshly-killed birds, a just perceptible rufescent tinge; wing lining and axillaries pure white; wing pale brown, narrowly margined and tipped with rufescent white; the tertiaries pale dingy rufescent with brown shafts.

"*Length.*—4·8 to 4·9 inches, expanse 7 to 7·2, tail from vent 1·8 to 2, wing 2 to 2·2, wing when closed reach to within 1 to 1·2 of end of tail, bill at front 0·3 to 0·33, tarsus 0·8, irides yellow to orange yellow, legs and feet pale yellow, in some very pale lemon yellow, claws dusky, bill pale yellow, dusky, or horny grey on culmen and at tip."—*Hume, Str. F.* i. p. 199.

Hab.—Sind, Beloochistan, Kokand, Southern Persia and Algiers; also Punjab, N. W. Provinces and Rajputana. Breeds in Turkistan. In Sind it is a winter visitant, affecting arid plains, and sides of hills wherever there is an abundance of scrubby vegetation.

Sylvia familiaris. *Menetries, Cat. Rais. Cauc.* p. 32; *Seebohm. Monog. B. Br. Mus.* p. 36. Aedon familiaris (*Menetr.*) *Gray, Gen. B.* i. p. 173; *id. Handlist B.* i. p. 211; *Dresser, B. Eur.* pt. xxxii.; *Hume, Str. F.* iii. p. 476; *Murray, Hdbk., Zool., &c., Sind*, p. 151.—THE GREY-BACKED WARBLER.

The following is Mr. Hume's description of Indian specimens, *ex* "*Stray Feathers*," vol. iii. p. 477.

"A broad superciliary stripe from the nostrils over and for some little distance behind the eyes dull white or yellowish white; a brown stripe from the nostrils to the anterior angle of the eye, continued backwards, though not conspicuous, for some distance from the posterior angle; forehead, crown, occiput, sides of the neck, entire back and wing dull earthy brown, paler and more drabby in some; quills and coverts margined and narrowly tipped with dull yellowish or brownish white, with usually a slight rufescent tinge on the margins of the primaries. Rump brownish chestnut; upper tail-coverts and tail

chestnut; central tail feathers more or less brown on one or both webs; all the other tail feathers with a conspicuous subterminal dark brown band (which in the outer feathers runs some distance down the outer web) and tipped, the two pairs next the centre narrowly with rufescent, and the other three successively more or more broadly with pure white. Chin and throat sordid white, with an indication of a darker line at the angle of the gape; ear-coverts and the rest of the lower parts similar, but tinged with a faint brownish shade usually. Wing lining and axillaries with a very faint yellowish salmon tint; inner margins of inner webs of quills, on the lower surface, with a decided buffy salmon tinge.

"*Length.—Male*, 6·5 inches, expanse 9·75, tail from vent 2·62, wing 3·3, tarsus 0·97, bill at front 0·77, bill at gape 0·87.

"*Length.—Female*, 7·5 inches, expanse 10·62, tail 2·62, wing 3·5, tarsus 1·03, bill at front 0·08, bill from gape 0·93, mid-toe and claw 0·87, hind toe and claw 0·56.

"The first quill is about 0·75 long; the third quill is longest; the second and fourth which are nearly equal about 0·06 shorter, the fifth about 0·25 shorter, tail somewhat rounded; outer tail feathers about 0·35 shorter than those next the central pair, which latter are shorter than those next them by about 0·15, the frontal feathers are prolonged over the base of the bill, extending laterally quite to the nostrils. Legs and feet dusky or livid fleshy; irides dark brown; bill dusky brown; lower mandible yellowish fleshy at the base."

Hab.—Afghanistan, Beloochistan, Persia, Sind, Kutch, Jodhpore and North Guzerat, visiting Sind in the course of its migration about the middle of September.

Sub-Family, MOTACILLINÆ,—Wagtails and Pipits.

Bill of moderate length, straight; keel rather curved at end; sides compressed. Nostrils in a small groove; rictal bristles very minute or absent. Wings long and pointed; tail long. Tarsi slender and long, with transverse scales; toes and claws long.

Gen. **Motacilla**.—*Lin.*

Bill moderate; nostrils oval, partially hidden by a membrane. Wings long and pointed; 2nd and 3rd quills longest. Tail long, even or forked. Hind toe long.

Motacilla madraspatana, *Brisson; Gould. B. of Asia.* pl.; *Jerd.* ii. 217, No. 589; *Hume, Str. F.* i. 26; *Murray, Str. F.* ii. 113; *id. Hdbk., Zool., &c., Sind*, p. 165.—The Pied Wagtail.

Head, lores, sides of the face, nape, ear-coverts, chin, throat, breast, back, rump and upper tail-coverts black; a broad white stripe from the nostrils over the eye as a supercilium and extending to the nape; primaries and their coverts, secondaries, tertiaries, and inner webs of greater coverts dark brown; the primaries and their coverts narrowly, the secondaries, tertiaries, median and greater coverts tipped, and broadly margined on their outer webs with white, forming a conspicuous wing patch; the basal half of all the primaries and secondaries white on the

inner webs, and tipped with white; the inner webs of the innermost narrowly margined with white; tail black, the two outermost feathers on each side white, except a margin of dark brown on their inner webs, which is broader on the next outermost; breast, belly, vent, under tail and wing-coverts white; edge of the wing and thigh-coverts white, with a few dark spots; bill and legs black; irides dark brown.

Length.—8·25 to 9 inches, wing 3·75 to 4, tail 4, bill at front 0·5, tarsi 1·0.

Hab.—Nearly throughout India. Occurs in Sind, Kutch, Rajputana, Guzerat, Concan and Deccan, Khandeish, Berars, Central and Southern India, Ceylon and Sikkim.

Motacilla personata, *Gould. B. of Asia*, pl.; *Hume, Str. F.* vol. i. 26 to 30; iii. 250; *Murray, Hdbk., Zool., &c., Sind*, p. 166; *Gray, Cat. B. Br. Mus.* p. 246. Motacilla dukhenensis, *Jerd. B. Ind.* ii. p. 218, No. 591.

Adult Male.—A broad frontal band extending to the front of the eye and forming a narrow supercilium, white; sides of the face, ear-coverts, chin, throat, lower parts from below the breast, and under wing-coverts white; crown and nape black; breast black; back, rump and upper tail-coverts grey, the upper tail-coverts darker; primaries dusky brown, the outer webs darker; secondaries and tertiaries darker brown, margined on their outer webs and tipped with white; the secondaries margined for the basal half on their inner webs with white; tail black, the two outermost feathers on each side white, except a dark brown margin on their inner webs; bill and legs black; irides brown.

Length.—7·5 to 8 inches, wing 3·6 to 3·7 inches, tail 4·5 to 4·75, bill at front 0·75.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Central Provinces, Beloochistan, Persia, South Afghanistan, East Turkistan; also in Rajputana. A winter visitant throughout India; breeds in Persia.

The Wagtails of India have been fully treated of by Mr. Hume, in vols. I. and II. of *Stray Feathers*, in respect to the distinctness of the several species occuring in India, and the outcome of his investigations has placed the present species under the name it bears here, and 591 *M. dukhenensis*, of Sykes, the next species, is made a distinct species; both are winter visitants to the province. "In winter" Mr. Hume says, "both *M. personata* and *dukhenensis* entirely lose in both sexes the black of the head, which is replaced in the male by a dark, in the female by a light, grey. The black of the chin, throat, and breast is reduced in *dukhenensis* to a moderately broad more or less crescentic pectoral band with two ill-defined broken blackish stripes running up the side of the neck, as it were from the points of the crescent, which stripes never, I think, entirely disappear, though in some specimens they become entirely obsolete; the broad white frontal band remains unchanged in width or nearly so in the adult male, though its colour is less pure; but in the female it is greatly diminished in width so as in some

specimens to become almost obsolete; while in all specimens it is more or less overlaid with sordid grey. In *personata*, on the other hand, the whole breast *always* remains black, and though the chin and upper part of the throat are white, the lower part of the throat is still more or less speckled with black. In the perfect winter plumage of both species, the amount of the black on the breast, sides of the neck and throat at once serve to distinguish the two species, but specimens of *dukhenensis* changing into winter plumage often (so far as the amount of black on the throat is concerned) exactly resemble the perfect winter plumage of *personata*, and the only ready and unfailing diagnosis of the two species is that *in both sexes, and at all seasons, the ear-coverts and aural region are in personata*, black, blackish, or dark grey; *in dukhenensis*, pure white or greyish or sordid white."

Motacilla alba, *Lin. Syst. Nat.* i. p. 33; *P. E.* 652, i; 674, i; *Naum. vogt.* t. 86; *Gould. B. Eur.* i. pl. 143; *Blf. East. Persia*, ii. p. 232. Motacilla dukhenensis, *Sykes, P. Z. S.* 1832, p. 91; *Hume, Str. F.* vol. i. 26 to 30; vii. 136.—The White-faced Wagtail.

Adult.—Front of the head, lores, all round the eye, ear-coverts, cheeks and a broad stripe down the sides of the neck, white, as also the belly, vent and under tail-coverts; back of the head and nape, chin, throat and breast black; back and scapulars darker grey than in *personata*; upper tail-coverts dark brown, a few feathers margined white; primaries dusky brown, the out webs darker, with a very faint whitish edge; secondaries, tertiaries and inner webs of the median greater coverts dark brown, nearly black; all broadly edged white on their outer webs, and, except the primaries, tipped with white; the inner webs of the primaries and secondaries margined for their basal half with white; lesser wing-coverts concolorous with the back; tail black, the two outermost feathers white, except a dark brown margin for nearly three-fourths their length on their inner webs, and, in some specimens, on the outer near the shaft; under wing and thigh-coverts white, the latter with some dark streaks; bill and legs black; irides dark brown.

Length.—7·5 to 8 inches, wing 3·75, tail 4·75.

Hab.—East Europe, Asia Minor, North Africa, Palestine; Sind, Punjab, N. W. Provinces, Central Provinces to Cashmere; Beloochistan, Persia, Afghanistan, Kutch, Kattiawar, Jodhpore, Jeypore, North Guzerat, Deccan, Concan, Khandeish, Central India. Throughout India, the white-faced Wagtail is a winter visitant. Breeds in Persia.

Gen. **Calobates**.—*Kaup.*

Bill more slender and the wing shorter than in *Motacilla*; tarsi shorter; legs and feet pale.

Calobates boarula, *Penn*; *P. E.* 28, i.; *Edw. B.* pl. 259; *Naum. vogt.* t. 87; *Gould. B. Eur.* pl. 147. Calobates sulphurea (*Bechst.*) *De. F. Viag. in Pers.* p. 348; *Blf. East. Persia*, ii. p. 233; *Jerd. B. Ind.* vol. ii. p. 220; *Hume, Str. F.* vol. ii. p. 237; *Murray, Hdbk., Zool., &c., Sind.*, p. 167.—The Grey and Yellow Wagtail.

Head, nape, sides of the face and back pale grey, with an olive tinge; rump and upper tail-coverts pale greenish yellow; chin, supercilium and throat white, rest of under surface yellow, purest on the middle of the abdomen, under tail-coverts and flanks; primaries dusky brown, lighter on the margin of their inner webs, and darker on the outer; secondaries dusky brown, white on both webs at their bases, forming a conspicuous wing band; tertiaries dark brown, also white at their bases, and edged on both webs with yellowish, narrow on the outer, and broad on the inner webs, being a continuation of the basal white patch; tail dark brown, nearly black, the feathers with greenish yellow edging, the outermost feathers white, and dark shafted; the next also white, both the shaft and outer web for three-fourths their length dark brown; bill black; legs pale brown; irides brown.

Length.—7·25 to 7·5 inches, wing 2·25 to 2·5, longest tertiaries the length of the first three primaries, tail 3·8, bill at front nearly 0·5. In summer plumage the chin and throat are black, and the under parts dark yellow.

Hab.—Central and Southern Europe, N. E. Africa, Australia and Asia Minor. Occurs throughout India to Nepaul and Ceylon as a winter visitant; also in Sind, Punjab, and N. W. Provinces; Beloochistan, Persia and Afghanistan; Kutch, Kattiawar, Jodhpore, Jeypore, North Guzerat, Concan, Deccan, and Central and Southern India.

Gen. **Budytes.**—*Cuv.*

Characters same as those of *Motacilla*. Tarsi longer; longest tertiary equal to the fifth primary, or intermediate in length between the fourth and fifth; hind toe and claw longer.

The following is a key to the species of this genus in summer plumage, given by G. F. L. M. in *Stray Feathers*, vol ix.:—

A. With the entire head yellow.
  Entire back black.—1 *B. calcaratus.*
  Back grey.—2 *B. citreola.*

B. Top of head pure black, supercilium narrow or wanting.—
  3 *B. melanocephala.*

C. Crown yellowish green, supercilium broad and yellow.—
  4 *B. rayi.*

D. With the crown grey.
  Crown pure light grey; supercilium white, broad; cheeks pale grey or pale white.—
    B. dubius = *B. beema*, Sykes.
  Crown deeper grey, supercilium white, broad; cheeks dark grey, with a few white streaks.—
    B. flavus.
  Crown dark grey; supercilium white, narrow or wanting; cheeks dark slaty, almost black.—
    B. cinereocapillus.

Budytes melanocephala, *Licht.*; *Rupp. Atl. F. Ab.* pl. 33. f. 6; *Naum. vogt.* t. 374; *Hume, Str. F.* vol. vi. 663; *Blf. East. Persia*, ii. 235; *Murray, Hdbk., Zool., &c., Sind*, p. 167. Budytes viridis, *Jerd.* ii. p. 222, No. 593. Budytes flava *et* melanocephalus, *Sykes*.—THE INDIAN FIELD WAGTAIL.

Adult Male in Breeding Plumage.—Head, nape, lores, sides of the face and ear-coverts black; back, scapulars, rump and upper tail-coverts yellowish green, the latter lighter, and the feathers edged with yellowish; chin white or buffy white; rest of under surface pure yellow; primaries and secondaries dull brown, lighter and whitish on the margins at the base of their inner webs; tertiaries dark brown, edged on their outer webs with yellow; lesser wing-coverts yellowish olive, subterminally dark brown, and tipped yellowish; median and greater coverts dark brown, tipped yellowish, forming two conspicuous wing bands; tail black, margined with greenish, the two outermost feathers on each side white, except a broad dark brown margin on their inner webs; bill and legs dark brown; irides brownish.

Length.—6·25 to 6·5 inches, wing 3·1 to 3·25, tail 2·75, bill at front 0·43.

The adult in winter garb is olive green above, with a yellowish white supercilium; the chin and throat white, and the rest of the under surface yellow; the wing bands formed by the median and greater coverts are paler, the yellow edgings of the tertiaries broader and purer yellow. The female is like the male, but in some specimens (in December) there is a brown band across the breast.

Hab.—S. E. Europe, N. E. Africa, and Moluccas; Sind, Punjab, N. W. Provinces, Bengal, Southern and Central India, Deccan, Concan, Kutch, Kattiawar, Jodhpore, Beloochistan and Afghanistan With the last species it is very abundant in the large marshes, and especially on the Munchur Lake in Sind.

Budytes flava, *Lin.*; *P. E* 674. 2; *Edw. B.* pl. 258; *Naum. vogt.* t. 88; *Gould. B. Eur.* pl. 146; *Blf. East. Persia*, ii. p. 233; *Hume, Str. F.* ii. p. 225; vi. 363; vii. 130. Parus luteus, *S. G. Gmel. Reise.* iii. p. 104, pl. xx. Motacilla flaveola, *Pall. Zoogr. Ros. As.* i. p. 501.—THE LONG-CLAWED YELLOW WAGTAIL.

Male in Breeding Plumage.—Forehead, crown, nape, and sides of the face, bluish grey, a dark streak from the base of the bill through the eye, a white supercilium, and another short white stripe below, from under the eye; below the bluish grey of the face an albescent streak to the chin, which is white; throat, breast, and rest of under surface bright yellow; neck behind, and back yellowish green, tinged brownish; greater and lesser wing-coverts dusky brown, margined with yellowish white; primaries, secondaries and tertiaries dusky brown, margined with yellowish white; tail dark brown, edged with greenish yellow; the two outermost feathers white, with a dark brown margin on their inner webs, broader on the second, and extending over part of the outer web; the next narrowly edged with white; upper tail-coverts like the back. The female has a white supercilium; the head and crown duller, mixed

somewhat with greenish later in the year; the chin is white, and the throat a yellowish or buffy white; breast and under parts pale yellow; back greyish brown; bill and legs dark brown; irides dusky brown.

Length.—6 to 6·5 inches, wing 3·25, tail nearly 3, bill at front 0·6.

Hab.—Central Europe, Asia, nearly throughout India to the Himalayas, also in Japan and Africa. A winter visitant in India; Sind.

Budytes citreola, *Pall.*; *Reise.* iii. 5696; *Gould. B. Eur.* pl. 144; *Naum. vogt.* t. 377, 2, 3, 4; *Murray, Hdbk., Zool., &c., Sind*, p. 168; *Hume, Str. F.* vii. 401. Motacilla citrinella, *Pall. Zoogr. Rosso. As.* i. p. 502. Budytes aureicapilla, *Less.*—The Grey-backed Yellow Wagtail.

Adult.—Forehead, crown of head, sides of the face, ear-coverts, chin, throat, breast, and entire under surface bright yellow, paler on the vent, and nearly white on the under tail-coverts; nape and upper back black; lower back and scapulars dark grey; rump and upper tail-coverts pale or dark brown or yellowish green, the feathers edged with greenish; primaries and secondaries dusky; tertiaries dark brown; the primaries and secondaries faintly edged and tipped with white, and the tertiaries broadly so, all basally white on their inner webs; lesser wing-coverts like the back and tipped brown; median and greater coverts brown, edged with white and forming two conspicuous white or yellowish white bands; the second band oblique in the closed wing, being formed by the white of the greater coverts, and that of the innermost tertiaries, the longest of which is nearly equal in length with the 4th primary; under wing-coverts white; tail black; the feathers with a faint tinge of whitish on their outer webs; the two outermost tail feathers on each side white, with a brown margin on their inner webs, to about half an inch from the tip; the next black, with the edge of the outer web and tip white; bill and legs pale brown; irides brown.

Length.—7·1 inches, wing 3·18, tail 2·75, bill at front 0·4.

Hab.—E. Europe, Africa; Sind, Punjab, N. W. Provinces, Oudh, Bengal; Kutch, Kattiawar, Rajputana, Deccan; Beloochistan, Persia, Afghanistan, and E. Turkistan.

Budytes calcaratus, *Hodgs. Jerd. B. Ind.* ii. p. 225; *Hume, Str. F.* vii. 401; *Murray, Hdbk., Zool., &c., Sind*, p. 168. Budytes citreoloides, *Hodgs.*—The Yellow-headed Wagtail.

Adult Male in Breeding Plumage.—Entire head, chin, throat, breast, and under surface bright yellow; back, rump and upper tail-coverts dark brown, nearly black; lesser wing-coverts dark grey; median and greater wing-coverts dark brown, margined and tipped with white; the tertiaries broadly margined with white; primaries and secondaries dark brown on their outer webs, dusky on their inner, and with whitish margins; tail dark brown or black, the feathers very narrowly edged with greenish; the four outermost white, except a dusky brown margin on the inner web for three-fourths their length. In winter the adult is light ashy grey above, the nape and sides of the breast darker; head and under surface yellow, olivaceous on the flanks; primaries dusky, edged with greyish white on their outer webs; secondaries dusky; tertiaries darker, broadly

margined with white; wing-coverts brown, broadly tipped with white, forming two conspicuous wing-bands; lower tail-coverts albescent or very pale yellow; tail as in the breeding plumage; bill and legs black; irides brown.

Length.—6·5 to 7 inches, wing 3·5, tail 3·5, bill at front 0·5.

Hab.—India generally to Nepaul. Affects, during winter, the paddy fields, the banks of the River Indus, marshes and canals. Numerous in Sind, on the Munchur; also in Rajputana and the Deccan, Beloochistan, Afghanistan, and E. Turkistan.

Gen. **Anthus**.—*Bechst.*

Bill straight, short, and stouter than in *Budytes;* wings, 1st to 3rd quills longest; plumage spotted; hind claw short and curved.

Anthus arboreus, *Bechst.* Pipastes plumatus, *Mull.; P. E.* 660,1; *Naum. vogt.* t. 84, 2; *Gould. B. Eur.* pl. 139. Anthus trivialis, *Linn. Sys. Nat.* Pipastes arboreus, *Jerd. B. Ind.* ii. p. 229, No. 597; *Murray, Hdbk., Zool., &c., Sind*, p. 168.—The European Tree Pipit.

Head, nape, back and scapulars dusky olive green, the feathers centred dark brown; rump and upper tail-coverts duller olive green, with no dusky striæ; chin and throat fulvescent or fulvous white, with dark brown spots on the throat; rest of under surface fulvescent, olive on the flanks, and the under tail-coverts albescent; the breast streaked with dark brown; primaries, secondaries and tertiaries dark brown, the primaries narrowly edged on their external webs with pale white; the secondaries and tips of the primaries white, the tertiaries broadly margined with dusky olive; the wing-coverts brown, with yellowish white tips; tail brown, the feathers with pale edgings; the outermost feather white, except the basal fourth and margin of the inner web to within one-fifth of the tip; the next all brown, edged and tipped with white; bill dusky, yellowish at base of lower mandible; legs pale brown; irides dark brown.

Length.—6·5 inches, wing 3·5, tail 2·5, bill at front 0·43, tarsus 0·8.

Hab.—Europe, and India generally to Nepaul; Sind, Punjab, N. W. Provinces, Oudh, Central India, Beloochistan, S. and N. Persia, Afghanistan; Kutch, Kattiawar, N. Guzerat, Jodhpore, and the Deccan.

Anthus spinoletta, *Linn.; P. E.* 661, 2; *Naum. vogt.* t. 85, 2,3,4; *Hume, Str. F.* i. 204; v. 345; vii. 521; *Blanford, East. Persia*, ii. p. 236; *Murray, Hdbk., Zool., &c., Sind*, p. 169.—The Water Pipit.

"In the winter plumage the upper surface is a sort of olive brown, with more or less of a faintly rufous tinge; the rump unstriated; the head and back with dark hair brown centres to the feathers; there is a well-marked dull white stripe from the nostrils over the eye; the coverts and the quills are mostly hair brown, the former broadly margined with brownish or olivaceous white, purer just at the tips of the coverts, and the latter narrowly margined, the first few primaries with greyish white, the rest with a sort of greenish or olivaceous white; the tippings of the coverts form two tolerably well-marked wing bars; the tertiaries, which are somewhat paler than the rest of the quills, are

broadly margined with brownish white. The central tail feathers, which are the shortest, are a comparatively pale brown, margined all round with brownish white; the next pair on either side are very dark brown, very narrowly margined with pale olivaceous, and the fourth with a tiny whitish spot at the extreme tip; the exterior tail feathers of all has the whole outer web white, slightly brownish towards the tip, the whole inner web white for nearly half an inch from the tip, beyond which for another three quarters of an inch the white occupies (next the shaft) a gradually diminishing portion of the inner web, the rest of the feather being brown. The lower surface is a dull white, in many specimens with a faint vinaceous tinge, in parts with a row of small brown spots down the sides of the neck, with similar spots on the breast and longer striæ along the sides and flanks.

"In the summer plumage the whole upper surface becomes greatly overlaid with an earthy or greyish brown shade, the striations of the back and head almost disappear, though the edges of the feathers are still somewhat paler than the centres, and the whole lower parts become a nearly uniform pale vinaceous colour, without, in what I take to be the perfect plumage, a single spot or streak; in some specimens, which is somewhat less advanced, a few spots still remain on the breast, and one or two streaks on the flanks. In all stages of plumage the axillaries are white, and greater portion of the wing lining and the lower surface of the quills pale satin grey.

"*Male, length.*—6·75 to 7·25 inches, expanse 11 to 11·25, wing 3·46 to 3·6, bill at front 0·45 to 0·53, hind toe and claw 0·7 to nearly 0·8, weight nearly one oz.

"*Female, length.*—6·37 to 6·62 inches, wing 3·15 to 3·3, expanse 9·5 to 10·5, bill at front 0·45 to 0·5, hind toe and claw 0·7 to 0·75, legs and feet brown, or dark brown, bill dark horny brown."—*Str. F.* i. p. 204.

Hab.—Central and Southern Europe and N. E. Africa; Sind, Punjab, N. W. Provinces, Beloochistan, Persia, Afghanistan, and E. Turkistan. In India during winter only.

Anthus blackistonii, *Swinh. P. Z. S.* 1863, p. 90; *Hume, Str. F.* v. 345; *Murray, Hdbk., Zool., &c., Sind.* Anthus neglectus, *Brooks, Ibis*, 1876, 501; 1877, 206.—Blackiston's Pipit.

Upper parts light yellowish brown, grey on the nape; crown and back with the centres of the feathers deep brown; lores, eyebrow and chin cream white; under parts cream white, spotted on the breast and streaked on the flanks with brown; axillaries pure white; wings brown, feathers edged paler; coverts and tertiaries broadly edged and tipped with cream white, forming a double bar across the wing; tail brown, the central feathers yellowish brown, edged paler; the outer lateral tail feathers white on the entire outer web and great part of inner near the apex; second lateral feather edged exteriorly, and largely tipped with white. Bill blackish brown on culmen and tip, light brown on remainder; legs blackish brown (brown, *Brooks*) paler on tarsi.

Length.—5 inches, wing 3·7, tail 2·7, tarsi 8·5. Mr. Brooks in the "Ibis" for 1877, page 206, states that he finds on comparison his *Anthus neglectus* identical with Swinhoe's *Blackistonii*, but in regard to the dimensions he observes:—"The total length given by Mr. Swinhoe is clearly wrong; so also with regard to length of wing. I have shot about forty examples, and the greatest total length observed was 6·3, the longest wing 3·4, longest tail 2·65."

The following are dimensions of some of his examples:—

		Wing.	Tail.	Bill at front.	Tarsus.
1	Male.	3·22	2· 6	·45	·88
2	,,	3·14	2·63	·45	·88
3	Female.	3·15	2·57	·45	·87
4	,,	3·33	2· 6	·46	·83
5	,,	3·25	2·55	·46	·88
6	,,	3· 2	2·65	·45	·88
7	,,	3· 2	2·55	·43	·87
8	,,	3·28	2· 5	·45	·85
9	,,	3·23	2·65	·45	·86
10	,,	3·12	2·45	·43	·87
11	,,	3· 3	2·52	·45	·88
12	,,	3· 1	2· 5	·45	·83

Hab.—China; in India, Sind, Punjab and N. W. Provinces and Afghanistan; frequenting extensive swamps. A winter visitant.

Gen. **Corydalla.**—*Vigors.*

Bill stout; tarsi moderately long; tertiaries generally intermediate in length between the 4th and 5th primaries; hind claw elongated.

Corydalla rufulus, *Viell. Gal. des. Ois.* t. 161; *Jerd. B. Ind.* ii. p. 232, No. 600; *Hume, Str. F.* vol. i. 358; vi. 366; viii. p. 386; *Murray, Hdbk., Zool., &c., Sind*, p. 168. Cichlops ubiquitarius, *Hodgson.*—The Indian Tit-Lark.

Head, nape, back, scapulars and upper tail-coverts olive brown, the feathers with dark mesial streaks; rump unstreaked pale olive; supercilium fulvous white; chin white; throat, breast, and rest of under surface, including the under wing-coverts, fulvous white, deeper on the breast and sides of the throat, the feathers of which are centred darker; primaries, secondaries, tertiaries and wing-coverts brown; the primaries slightly paler brown and edged externally with fulvous white; the secondaries edged with light olive brown and tipped whitish; the tertiaries broadly edged externally with pale olive or fawn brown, all, except the innermost tertiaries, fulvous and basally whitish on their inner webs; tail dark brown, the two centre feathers shorter than the others, pale brown and margined narrowly with pale olive; the outermost feathers on each side white, except a narrow margin on the inner web, which is brown; the next feather also white, with a dark shaft, and a wider brown margin on the inner web; bill dusky, yellowish at base of lower mandible; irides brown; legs pale yellowish brown.

Length.—6·5 to 7 inches, wing 3 to 3·25, tail 2·5, tarsi 1, bill at front 0·4.

Hab.—Sind, Punjab, N. W. Provinces, Bengal, Assam, British Burmah, and Nepaul; also Beloochistan, Afghanistan and Eastern Turkistan. Common in the Concan and Deccan; breeds in Sind during April and May. Eggs 3—4, of a greenish colour, with numerous brown mottlings all over, chiefly at the larger end.

Gen. **Agrodroma**.—*Sws.*

Characters same as those of *Corydalla*, but with the hind claw shorter.

Agrodroma campestris, *Bechst.*; *P. E.* 661,2; *Naum. vogt.* t. 84,1; *Gould. Birds Eur.* pl. 137; *Jerd. B. Ind.* ii. p. 234; *Hume, Str. F.* i. 202; *Murray, Hdbk., Zool., &c., Sind*, p. 168.—The Stone Pipit.

Head, nape, back, scapulars, rump and upper tail-coverts olive brown, with a faint rufescent tinge, the feathers of the head with mesial dark streaks, those of the back very faintly streaked or absent; rump unstreaked, upper tail-coverts with dusky shafts; chin whitish; rest of under surface and supercilium pale or rufescent fawn, albescent on the vent and under tail-coverts; a brown stripe from the base of the lower mandible down the sides of the throat, another from the gape; primaries and secondaries very pale brown, edged externally with pale or rufescent fawn; the secondaries tipped whitish; tertiaries brown, with broad fulvous or pale fawn margins; wing-coverts brown, broadly tipped and edged with the same colour; tail dark brown, the feathers edged fulvous, the centre feathers broadly edged with fawn, the outermost feather on each side white, basally dark shafted, and margined on the inner web with brown, the next, edged on the outer web, tipped, and for about an inch running up the inner web, whitish; the shaft and rest of the feathers brown; bill horny; lower mandible yellowish; legs yellowish.

Length.—7 to 7·25 inches, wing 3·6, tail 2·75 to 3, tarsi nearly 1, bill at front 0·5.

Hab.—Central and Southern Europe, N. and W. Africa, Central and Southern India, Sind, Punjab, N. W. Provinces and Bengal, Beloochistan, Persia and Afghanistan, Kutch, Kattiawar, Jodhpore, Jeypore and N. Guzerat, Concan and Deccan. Arrives in Sind about September; less common in the Southern districts.

Agrodroma sordidus, *Rupp. Neu. Wirb.* p. 103, pl. xxxix. fig. 1; *Jerd. B. Ind.* ii. p. 236; *Layard, Ibis*, 1871, p. 228; *Tristram, Ibis*, 1869, p. 437; *Murray, Hdbk., Zool., &c., Sind*, p. 169; *Blf. East. Persia*, p. 237. Corydalla griseo-rufescens, *Hume, Ibis*, 1870, p. 286. Anthus jerdoni, *Finsch. Trans. Zool. Soc.* vii. p. 241.—The Brown Rock Pipit.

Head, nape, back, scapulars, rump and upper tail-coverts dull earthy brown, the feathers edged paler; wings and tail darker brown than the upper parts; supercilium fulvous or fawn coloured; a faint brown stripe from the base of the lower mandible down the sides of the

throat; primaries, secondaries and tertiaries as in the last, but edged with rufescent; first primary short, dark brown, outermost feathers rufescent on their outer webs, and for about an inch and a quarter obliquely on their inner webs at the tip, rest of the feather dark brown, the next dark brown, except at the tip and for a short distance (¼ of an inch) along the shaft; chin and throat whitish, rest of under surface bright rufescent fawn; the breast with a few indistinct streaks; bill dusky; lower mandible yellowish, except at tip; legs yellowish.

Length.—7·75 to 8 inches, wing 4, tail 3·5, bill at front 0·5.

Hab.—India generally to the Himalayas, Sind, Punjab, N. W. Provinces, N. Guzerat, Deccan, Beloochistan and Persia.

Family, AMPELIDÆ.

Bill moderate, broad at base, sides gradually compressed to tip; wings long or moderate; tail short or moderate; toes moderate, outer united to inner at base.

Sub-Family, LEIOTRICHINÆ.—*Sws.*

Bill short, wide at the base, somewhat conic, acute at tip, entire or notched; tail even or slightly rounded; tarsi short.

Gen. Zosterops.

Bill slightly notched, curved; eyes with a circle of white feathers; nostrils exposed; 3rd and 4th primaries longest.

Zosterops palpebrosus, *Tem. Pl. Col.* 293, f. 3; *Jerd. B. Ind.* ii. p. 265; *Hume, Str. F.* vol. ii. 242; vol. iv. 291; *Murray, Hdbk., Zool., &c., Sind,* p. 169.—The White-eyed Tit.

Head, nape, back, scapulars, rump, and upper tail-coverts siskin green, yellowish on the upper tail-coverts; chin, throat, and upper breast canary yellow; eyes with a circle of white feathers; lower breast, abdomen and flanks white with a bluish tinge; vent, under tail and thigh-coverts yellow; primaries, secondaries and tertiaries brown, edged externally with the colour of the back, all margined white on their inner webs, except the innermost tertiaries; edge of wing and under wing-coverts yellowish; tail brown, the feathers margined on their outer webs with greenish, and on their inner webs with whitish; bill blackish brown; legs horny brown.

Length.—4·5 inches, wing 2·3, tail 1·7, bill at front 0·33 to 0·4, tarsus 0·75.

Hab.—India generally to Assam, Arracan, Nepaul and Ceylon; also Sind, (probably Kutch) Rajputana, Deccan, Concan, Central and Southern India.

Tribe, CONIROSTRES.

Bill strong, conical, entire at the tip; wings lengthened or moderate, mostly pointed; tail usually moderate, or short, rounded, even or emarginate; tarsi strongly scaled; toes moderate.

Family, CORVIDÆ.

Bill strong, more or less compressed; keel arched; nostrils at base concealed by stiff bristles; tarsi stout; toes moderate.

Sub-Family, CORVINÆ.

Bill stout, long, straight; keel arched; tarsi stout, scutate.

Gen. Corvus.—*Linn.*

Bill stout, strong and long; nostrils covered by bristly plumes; wings long and pointed; 1st quill short, 3rd and 4th longest.

Corvus lawrencei, *Hume, Lahore to Yarkand*, p. 235; *id. Str. F.* vol. i. p. 205; *Adam*, t. c. p. 385; *Hume, Nest and Eggs, Ind. B.* p. 408; *Stol. S. F.* 1864, p. 474; *Ball. S. F.* 1875, p. 207; *Murray, Hdbk., Zool., &c., Sind*, p. 172; *Sharpe, Cat. B. Br. Mus.* vol. iii. p. 15.—The Indian Raven.

Uniform blue-black throughout, with a purplish tinge on the throat and upper breast; feathers of the chin and throat lanceolate; bill black; incumbent bristles in front extend to beyond more than half of the length of the bill, which is much arched; irides dark brown or grey brown; legs black.

Length.—23·75 to 24·75, wings 16·3 to 17·4, when closed reach to about from 0·3 to 0·5 of the end of the tail, bill at front 2·8.

Hab.—Sind, Punjab, N. W. Provinces, Kutch, Kattiawar, Rajputana, Beloochistan and Afghanistan; found in some numbers in Upper Sind in flocks of from 30 to 50 at the beginning of winter, when a great number are to be seen dead under the trees about Jacobabad and Shikarpoor.

Corvus umbrinus, (*Hedenb.*) *Sundev. Œfv. K. vet. Akad. Forh. Stockh.* 1838, p. 199; (*ex Hedenb. Ms.*); *Heugl. Orn. N. O. Afr.* pp. 505, 125; *Shelley, B. Egypt*, p. 158; *Dresser, B. Eur.* pl. xxxiv., xxxviii.; *Blf. East. Pers.*; *Murray, Str. F.* vol. vii. p. 113; *Hume, Str. F.* vii. p. 120; *Murray, Hdbk., Zool., &c., Sind*, p. 173. Corvus infumatus, *Wagn. Munch. gel. Anz.* 1839. Corvus corax, *Horsf. and Moore, Cat. B. Mus. E I. Co.* ii. p. 552.—The Afghan Brown-necked Raven.

Head and neck glossy umber brown, also the ear-coverts, sides of the face and sides of the neck, the latter scarcely glossed; lores, incumbent nasal bristles, feathers round the eye, and at base of bill at the gape, black; back, scapulars, wings, wing-coverts, upper tail-coverts and tail glossy black with a violet blue gloss; chin, throat and breast dark glossy umber brown; rest of under surface brown, glossed with purple on the breast, flanks, abdomen and vent; under tail-coverts glossy purplish black; axillaries and under wing-coverts purplish black; bill and legs black; irides dark brown.

Length.—21·5 to 23 inches, wing 15 to 16·4, tail 8·6 to 9, tarsus 2·9, bill at front 2·9 to 3.

Hab.—This fine Raven occurs during winter in the northern parts of Sind, where it is not uncommon at Larkhana and Jacobabad from December to March. It has hitherto been known from N. E. Africa, Palestine, and Beloochistan, about as far east as 62° east long. Its occurrence at Jacobabad extends its range to nearly 69° east long. Occurs also in Beloochistan, S. Afghanistan, S. Punjab (Ferozepore) Egypt, Mesopotamia, and Cashmere (Gilgit).

Corvus splendens, *Viell. N. Dict. d' Hist. Nat.* viii. p. 44; *Tem. Pl. Col.* ii. pl. 425; *Gray, Gen. B.* ii. p. 315; *Jerd. B. Ind.* ii. p. 298; *Hume, Str. F.* vol. viii.; *Murray, Hdbk., Zool., &c., Sind,* p. 173. Corvus impudicus, *Gray, Handlist B.* ii. p. 14; *Hume, Str. F.* i. p. 206; *Str. F.* ii. pp. 418, 493.—The Common Indian Crow.

Nasal bristles, crown of head, lores, sides of face, chin, throat, back, wings and tail glossy black with purplish or steel blue reflections; lower abdomen, flanks, vent, under tail and thigh-coverts dull black; nape, hind neck, sides of the neck, and part of the upper back a greyish drab; breast and upper part of the abdomen dark ashy; under wing-coverts and axillaries dull black; bill and legs black; irides deep brown.

Length.—16 to 17 inches, wing 11 to 11·25, tail 7, bill at front 1·12.

Hab.—Throughout India to the foot of the Himalayas and Ceylon.

Sub-Family, GARRULINÆ,—Jays.

Bill short and conic, about as high as broad at nostrils; nares usually tufted; wings moderate or long; 5th quill longest.

Garrulus.—*Briss.*

Bill short, thick, compressed, conic, slightly deflected, and bent at tip; nostrils covered with incumbent bristles.

Garrulus atricapillus, *Geoffr. St. Hilaire, Etud. Zool.* fasc. i.; *Dresser, B. Eur.* part xx. Garrulus melanocephalus, *Gene. Mem. Acad. Torino,* xxxvii. p. 298; *Bree. B. Europe; Blf. Eastern Persia,* vol. ii. p. 265; *Hume, Str. F.* i. p. 206; *Murray, Zool., &c., Sind,* p. 173; *Sharpe, Cat. B. Br. Mus.* iii. p. 97.—The Black-headed Jay.

Adult Female.—General colour above clear vinaceous, washed with grey; the rump and upper tail-coverts white (wings and tail much as in *G. cervicalis*); wing-coverts grey, the least coverts barred with chestnut, the median series broadly chestnut at tip; the greater series velvety black, the outermost barred with blue and black; the bastard wing and primary coverts cobalt blue, narrowly barred with black; quills brownish black, externally greyish white; the secondaries white for two-thirds of the outer web, with slight indications of blue bars, the innermost black, inclining to chestnut on all but the tip of the last secondary; tail brownish black, bluish grey at base, and barred with the same colour for more than half the length of the centre feathers; nasal bristles white, washed with vinaceous at the tip; forehead, feathers round the eye, a broad eyebrow and the sides of the face and neck, as well as the throat, white; a broad malar bar of black; rest of under surface pale vinaceous, deeper on the sides of the body and under wing-coverts, and inclining to buffy white on the centre of the abdomen, thighs and under tail-coverts.

Length.—12·7 inches, culmen 1·2, wing 6·7, tail 6.

Adult Male.—Similar to the female; showing less grey on the back and rather more on the chest; the face and throat sometimes washed with a vinous tinge.

Length.—14·5 inches, wing 7·6, tail 7, culmen 1·4.—(*Sharpe, Cat. B. Br. Mus.* vol. iii. pp. 97, 98.)

Hab.—Sind, on the hills dividing Sind from Khelat (*Hume*). Syria and Palestine eastwards into Persia (*Sharpe*). Mr. Hume, in vol. i. p. 206 of *Stray Feathers*, states that he satisfied himself from the description given him of this bird, that it occurs on the hills dividing Sind from Khelat. I have no specimen from Sind, nor has Mr. Hume; but I give the above description of the bird to help its identification if met with.

Sub-Family, DENDROCITTINÆ,—Magpies.

Bill short; culmen elevated and curved; nares with velvety plumes; wings short, rounded; tail long, graduated; tarsi short.

Gen. **Dendrocitta**.—*Gould.*

Base of the culmen unfeathered; middle tail feathers broad at the ends; nostrils concealed by incumbent feathers; 5th and 6th quills longest; secondaries nearly as long as the primaries.

Dendrocitta rufa, *Scop. Del. Fauna et Flor. Insubr.* ii. p. 86; *Hartl. Syst. Verz.* p. 63; *Jerd. B. Ind.* ii. 314, No. 674; *Gray, Handlist, B. B. Mus.* ii. p. 8; *Hume, Str. F.* i. pp. 206, 386; *Murray, Hdbk., Zool., &c., Sind*, p. 174. Crypsirrhina pallida, *Blyth, J. A. S. B.* xv. p. 30. Dendrocitta pallida, *Blyth, Cat. Mus. A. S. B.* p. 336; *Jerd. B. Ind.* ii. p. 315, No. 675.—The Common Indian Magpie.

Adult.—Head, neck all round, part of upper back, chin, throat, breast and ear-coverts dark sooty brown, paler on the upper back; lores blackish brown; back and scapulars orange brown; rump and upper tail-coverts bright orange or yellowish buff; abdomen and under tail and thigh-coverts, like the rump, orange, yellowish buff or dark ferruginous; primaries and secondaries black; tertiaries black, greyish white on their outer webs; wing-coverts white; edge of the wing and under wing-coverts greyish white; tail greyish white, or grey, the centre feathers elongated much beyond the rest, and all broadly tipped with black; bill black; legs slaty; irides blood-red.

Length.—16—17 inches, wing 5·9, tail 10, tarsus 1·45, bill at front 1 to 1·25. The young is much paler throughout, and has the tail feathers tipped whitish buff.

Hab.—The whole of India, through Assam and Burmah to Tennaserim and Cashmere; Sind, Punjab, N. W. Provinces, Bengal, Southern India, Travancore, Central India, Kutch, Kattiawar, Rajputana, Concan, and Deccan.

Sub-Family, STURNINÆ.

Bill with the sides compressed, tip rather blunt and flattened; wings long and pointed; tail rather short; tarsi strong, scutate in front; toes long and strong.

Gen. **Sturnus**.

Bill sharp, straight, and with a conical groove; nostrils feathered; 2nd quill longest.

Sturnus vulgaris, *Lin.; Gould. B. Eur.* pl. 210; *P. E.* 75; *Naum. vogt.* t. 62.—THE COMMON STARLING.

Head, neck, nape, chin, throat, breast and back black, glossed with purple, bronze, and green in different lights, the latter predominating on the head and neck, each feather tipped with a small brownish white triangular or round spot, which, in very old birds, wear out on the head and neck chiefly. Greater and lesser wing-coverts dusky, edged with pale reddish brown; primaries, secondaries and tertiaries also dusky, their outer webs glossed with green, and margined with light reddish brown; tail short, dusky, their outer webs more or less glossed with green and edged with pale reddish brown or buffish; under tail-coverts black, edged with white; bill black; legs dark brownish red.

Length.—9 inches, wing 5, tail 3, bill at front 1·25.

Hab.—Europe, Asia, and India generally during winter, to the Himalayas.

Sturnus minor, *Hume, Str. F.* i. 207; v. 328; *Murray, Hdbk., Zool., &c., Sind*, p. 175.—THE LESSER STARLING.

"The general character of the plumage is like that of the ordinary Starling, but in the first place, whereas in the common Starling the reflections of the head are purple and of the back green; in these birds, the head is green and the back purple; secondly, whereas in the common Starling the wing varies from 5 to 5·35 and the tarsus from 1·1 to 1·2; in these birds the wing is only 4·3 and the tarsus barely 1; the bills are about the same length as the common Starling, measuring exactly an inch in front, but they are more pointed, have a more decided culmen ridge, and are less broad at the base."—(*Hume*).

Hab.—Sind; breeding from March to June.

Eggs not unlike in shape those of the common Starling, but decidedly smaller, a light pale bluish green, the shell finely pitted.

Gen. **Acridotheris**.—*Viell.*; Gracula, *Cuv.*

Bill stouter and shorter than in *Sturnus*. Culmen deflected at tip; nostrils concealed by the frontal plumes; tail rounded; tarsi stout; a naked space usually behind the eye; head crested or sub-crested; 1st quill rudimentary.

Acridotheris tristis, *Lin.; P. E.* 219; *Jerd. B. Ind.* ii. p. 325, No. 684; *Murray, Hdbk., Zool., &c., Sind*, p. 175.—THE COMMON MYNA.

Head sub-crested; nape, neck behind, chin, throat and breast glossy black; back, scapulars, rump and upper tail-coverts brown; wing-coverts, primaries and secondaries black; edge of the wing and the base of the primaries white, forming a conspicuous wing patch; tail black, the feathers tipped white; lower abdomen, vent and under tail-coverts white; bill and orbits deep yellow; legs dull yellow; irides reddish.

Length.—9·5 to 10 inches, wing 5·25, tail 3·5, bill at front 0·8 to 0·9.

Hab.—Throughout India to Assam, Burmah and Ceylon, and a resident everywhere; breeding in holes of trees, roofs of houses and almost anywhere, except on the ground, from June to August. Eggs 4, of a glossy pale green, greenish or deep bluish green colour.

Acridotheris ginginianus, *Lath.; Lev. O. A.* t. 95·2; *Jerd. B. Ind.* ii. p. 326, No. 685; *Murray, Hdbk., Zool., &c., Sind*, p. 175.—The Bank Myna.

Head, nape, sides of the face, lores and ear-coverts black; chin, throat, breast, flanks and outer thigh-coverts cinereous or dark ashy; neck, the back, rump and upper tail-coverts dark ashy; wings black, edge of wing and wing spot orange buff or ferruginous; tail black, the feathers tipped with dull ferruginous; middle of abdomen, vent, under tail, and inner thigh-coverts pale ferruginous; bill yellow, red at the tip; orbits and nude spot behind the eye red; feet dull yellow.

Length.—8·5 to 9 inches, wing 5, tail 3·25, bill at front 1·25.

Hab.—India generally to Assam and Burmah; common in Sind, Punjab, N. W. Provinces, Oudh, Bengal, Central India, Deccan, Concan, Kutch, Kattiawar and Jodhpore.

Gen. **Temenuchus**.—*Cab.*

Characters same as those of *Acridotheris*. Bill less stout, barely deflected at the tip; 1st and 2nd primaries sub-equal; head usually crested.

Temenuchus pagodarum, *Gmel.; Lev. O. A.* t. 95; *Gal. des Ois.* t. 148; *Jerdon, B. Ind.* ii. p. 329, No. 687; *Murray, Str. F.* vol. vii. pp. 112, 113; *id. Hdbk., Zool., &c., Sind*, p. 176.—The Black-headed Myna.

Head, with the long crest, nape and lores black; ear-coverts, sides of the neck and behind, breast and abdomen, fulvous or pale orange buff, the feathers with mesial whitish streaks; back, scapulars, outer webs of secondaries and tertiaries grey, the innermost tertiaries entirely grey; primaries dark brown, edged black on their outer webs; edge of wing, under wing, and under tail-coverts and the vent white; tail dark brown, the feathers broadly tipped white; the centre feathers grey like the back; bill bluish at base, rest yellow; irides whitish; legs bright yellow.

Length.—8·5 to 9 inches, wing 4·2, tail 3, bill at front 0·37.

Hab.—India, Ceylon, Cashmere, Assam, Burmah; common in Southern India and in the Carnatic, Travancore and the Northern Circars. Occurs also in Sind, Punjab, N. W. Provinces, Deccan and Concan, but not in any numbers; usually in company with *Acridotheris tristis*.

Gen. **Pastor**.—*Tem.*

Bill short, compressed, curving from the base, slightly deflected at the tip; groove of nostrils clothed with short plumes; 2nd quill longest, 1st spurious; tarsi scutate; tail even; head with an occipital crest.

Pastor roseus, *Lin.*; *Gould. Birds of Eur* pl. 212; *Naum. vogt.* t. 63; *Jerd. B. Ind.* ii. p. 333, No. 690; *Blf. East. Persia*, ii. p. 267; *Str. F.* i. 208; iii. 208, 495; *Murray, Hdbk., Zool., &c., Sind*, p. 176. Pastor peguanus, *Less.* Pastor suratensis et seleucus, *Gm. Syst. Nat.*; *Gray, Cat. B. Br. Mus.*—THE ROSE-COLOURED PASTOR.

Head, crest, crown, neck on the back and nape black, glossed with bluish purple; chin and throat black; entire back, breast, rump and upper tail-coverts pale salmon or delicate rose colour; wing-coverts black, the lesser series margined with grey, and the greater series glossy black with purple reflections; primaries dark brown, tinged with greenish; some of the secondaries glossy black, also with green reflections, and others only so on the outer web; tail greenish black; under tail-coverts black; bill yellowish rose; legs yellowish brown; irides deep brown.

Length.—9 to 9·5 inches, wing 5·25, tail 3, bill at front 0·8.

Hab.—S. E. Europe, Asia Minor, India, Ceylon, Assam, Burmah and Pegu. A winter visitant in most parts of India; arrives in Sind about the beginning of April in large flocks; in the Punjab and N. W. Provinces in August. Occurs also as a migrant in Beloochistan, Persia, Afghanistan and Eastern Turkistan.

Family, FRINGILLIDÆ.

Small birds with short, thick, conic bills, mostly angular at base; wings usually long; tarsi moderate.

Sub-Family, PLOCEINÆ,—WEAVER BIRDS.

Bill thick at base, with the keel projecting on the forehead and arched to the tip; wings rounded; 1st quill very short; tarsi and toes strong, scutate; hind toe long and strong.

Gen. **Ploceus.**—*Cuv.*

Characters same as those of Sub-Family; 3rd to 5th quills longest, first very short; tertials nearly as long as the quills.

Ploceus phillipinus, *Lin. Syst. Nat.* i. 305; *D'Aub. P. E.* 135, 2; *Reich. Sing.* t. 36, 283. Ploceus phillipensis, *Briss. Orn.* iii. 232, pl. xii. f. i. Ploceus maculata, *P. L. S. Mull. Suppl.* 150; *ex P. E.*; *Hume, Str. F.* vi. 399. Ploceus baya (*Blyth*) *apud. Jerd. B. Ind.* ii. 343, No. 694; *Murray, Hdbk., Zool., &c., Sind*, p. 176.—THE COMMON WEAVER BIRD.

Adult Male in Breeding Plumage.—Forehead, crown, sides of the neck and breast bright yellow; lores, sides of the face, ear-coverts, chin and throat dull brown, paler on the chin; back brown, the feathers with yellow edgings; rump paler brown, edged lighter; upper tail-coverts a dirty buff colour or rufous white; wing-coverts dull brown, the greater series and the primary coverts narrowly edged with greyish white; primaries, secondaries and tertiaries dull brown, the primaries with a narrow edging of pale yellow on their outer webs, also the secondaries; tertiaries broadly edged yellowish white; tail dull brown, the feathers faintly and narrowly edged with yellowish green; abdomen,

vent and under tail-coverts dull white, also the thigh-coverts; the middle of the abdomen and thigh-coverts tinged yellowish; edge of the wing fulvous white; bill black; irides brown; legs yellowish brown.

Length.—5·5 inches, extent 8·5, wing 2·75, tail 1·75, bill at front 0·6. The *Female* is like the male, but wants the yellow crown and breast, and the chin and throat are whitish or rufous white.

Hab.—Throughout India to Ceylon, Assam, Burmah and Nepaul. Common everywhere in Sind with the two next species, as well as in the Punjab, N. W. Provinces and Bengal, also Central and Southern India, the Concan and Deccan, Kutch, Kattiawar, Jodhpore and N. Guzerat. Breeds freely in company with *manyar* and *bengalensis*. Nest non-pensile, being attached to the upper stalks of reeds, with the leaves interwoven, smaller than that of *bengalensis* or *manyar*, less large in the body, and generally with a long and narrow tubular entrance. The unfinished-like nests are inhabited by the males. Breeds in Sind from April to June. Eggs white, 3, 4 or 5 in number. All the species of this genus are taken young by natives, and taught to perch on the hands and to perform various feats.

Ploceus manyar, *Horsfield, Trans. Lin. Socy.* xiii. 160; *Jerd. B. Ind.* ii. 348, No. 695; *Str. F.* i. 208; vi. 399; *Murray, Zool., &c., Sind*, p. 176.—THE STRIATED WEAVER BIRD.

Adult Male in Breeding Plumage.—Forehead and crown bright golden yellow; lores, cheeks, chin and throat and sides of the neck blackish or sooty brown; back, rump and upper tail-coverts brown, the feathers edged with fulvous white; wing-coverts, primaries, secondaries and tertiaries concolorous with the back, the primaries edged yellowish, and the secondaries, wing-coverts and tertiaries whitish or fulvous white; tail brown, the feathers edged greenish; breast and flanks fulvous white, with mesial dark streaks; abdomen and under tail-coverts white, tinged fulvous; bill black; irides brown; legs pale brown.

Length.—5·8 inches, wing 2·75, extent 9, tail 1·75, bill at front 0·56. Female and male in non-breeding plumage want the yellow head, and have a pale supercilium, and the chin and throat are whitish.

Hab.—Northern and Central India to Assam and Burmah. Occurs in Sind, Punjab, N. W. Provinces, Oudh, Bengal, Deccan, Concan, Travancore, Kutch, Kattiawar and N. Guzerat.

Ploceus bengalensis, *Linn. Syst. Nat.* i. 307; *D' Aub. P. E.* 393, 2; *Reich. Sing.* t. 33, 262; *Jerd. B. Ind.* ii. 349; *Str. F.* vi. 399; *Gray, Cat. B. Br. Mus.* p. 44; *Murray, Hdbk., Zool., &c., Sind*, p. 177.—THE BLACK-THROATED WEAVER BIRD.

Adult Male in Breeding Plumage.—Forehead and crown bright golden yellow; cheeks, ear-coverts, sides of neck and throat white, more or less suffused with dusky, a dark brown pectoral band; back dusky brown; rump and upper tail-coverts greyer; wings and tail dark brown, the coverts and secondaries with pale margins; body below fulvous white; flanks brownish. The female has the head dusky brown and unstreaked, the feathers of the back edged with pale rufous or fulvous; a pale

yellow supercilium and a spot of the same colour behind the ear-coverts; a small dark stripe at the base of the bill on each side, the throat yellowish, with a few dark spots; bill white; irides light brown; legs fleshy brown.

Length.—5·5 to 6 inches, wing 2·75, tail 1·75.

Hab.—Lower Bengal, extending into Assam and parts of Burmah. Occurs also in Sind; not known from the Punjab and N. W. Provinces.

Sub-Family, ESTRELDINÆ.

Bill large, conic, more or less bulged or slender; wings short, rounded; the 1st primary minute as in *Ploceus*.

Gen. **Munia.**

Bill thick, as long as deep; culmen arched, prolonged behind on the forehead; tarsi stout, moderate.

Munia malabarica. *Lin. Jard.; and Selby, Ill. Orn.* 2nd Ser. pl. 34; *Reich. Sing.* t. 150; *Jerd. B. Ind.* ii. p. 357, No. 703; *Murray, Hdbk., Zool., &c., Sind,* p. 177.—The Plain Brown Munia.

Head, back and scapulars pale earthy brown, the feathers of the head centred darker, giving it a rufescent brown appearance; rump pale earthy brown; upper tail-coverts white, barred with dusky; primaries, secondaries and tertiaries dusky brown; the secondaries and tertiaries rufescent brown on their outer webs and tipped very slightly with whitish; wing-coverts like the back, the first three or four from the edge of the wing dark brown; edge of the wing whitish; chin, throat, breast, belly, and under tail-coverts greyish white, the flanks and sides of the breast in some specimens with transverse bars of rufescent; under tail-coverts white; tail dark brown, edged with dark reddish brown, the central feathers broadly so, and prolonged 0·75 beyond the others; bill plumbeous; legs pale brown; irides deep brown.

Length.—5 inches, tail 2, wing 2·1, bill at front 0·4.

Hab.—Sind, Punjab, N. W. Provinces, Southern and Central India, Malabar, Deccan, Concan, Kutch, Kattiawar, Jodhpore, Jeypore, and N. Guzerat.

Gen. **Estrelda.**—*Sws.*

Bill not so broad, nor as high as in *munia*, and more compressed.

Estrelda amandava, *Linn.; P. E.* 115·3; *Reich. Sing.* t. 4, 25, 33; *Jerd. Birds Ind.* ii. p. 359, No. 704; *Murray, Hdbk., Zool., &c., Sind,* p. 177; *Gray, Handlist B.* i. p. 60.—The Red Wax-Bill.

Summer Plumage.—Feathers of the forehead and crown brown, tipped with crimson; a spot in front of the eye black; a bright crimson supercilium, and a row of white feathers under the eye; sides of the face, chin, throat, breast, flanks and upper tail-coverts crimson, the feathers basally dark brown, and those of the breast and upper tail-coverts and flanks with a terminal white spot; back, rump, wing-coverts, primaries, secondaries and tertiaries olive brown, the tips of

the coverts, tertiaries and some of the scapulars with a white spot; tail black, the outer feathers tipped with white; lower tail-coverts black; lower abdomen sooty or blackish brown. The female is like the male, with the lower back and rump tinged crimson and a few white spots; the abdomen and vent whitish, as also the lower tail-coverts; bill reddish, the upper mandible blackish on the edge; irides crimson; feet fleshy.

Length.—4 to 4·5 inches, wing 1·9, tail 1·4

Hab.—Throughout India to Assam and Burmah; common in Sind, affecting the woody districts, especially in the vicinity of the Indus. Breeds from May to September, making a rather loose purse-shaped structure of grass, and lined with the fine glossy filaments of *Calotropis procera*. Eggs, like those of the *Munia*, white, but smaller, and more elongate. It is also common in Kutch, Kattiawar, Rajputana generally; N. Guzerat, Deccan, Concan, Southern and Central India, Oudh and Lower Bengal, extending to the Himalayas.

Sub-Family, PASSERINÆ.

Bill short, sloping to tip; wings long and pointed; tarsi and tail moderate, slender and transversely scaled.

Gen. **Passer**.—*Briss.*

Bill broad at base, slightly scooped at tip; 2nd and 3rd quills longest; nostrils partly covered by plumes.

Passer indicus, *Jard. and Selby, Ill. Ind. Orn.* pl. 118. Passer domesticus, *Blyth, Cat.* 642; *Jerd. B. Ind.* ii. p. 362, No. 706; *Murray, Hdbk., Zool., &c., Sind.* p. 178.—The Indian House Sparrow.

Male.—Head and nape dark grey; lores, feathers below the eye, sides of the lower mandible, chin, throat and breast black; mantle and scapulars chestnut with dark mesial streaks; rump and upper tail-coverts ashy brown; lesser wing-coverts chestnut, the last row or series of feathers dark brown at the base and tipped with white; the greater series dark brown, edged with rufescent and tipped with fulvous white; primaries, secondaries and tertiaries dusky brown, edged with rufous, paler and narrow on the primaries, which are darkish brown on the middle of their outer webs; tertiaries tipped with fulvous white. Sides of the face, and neck, and entire under surface white, the flanks cinereous; tail dusky or pale brown, the feathers edged with fulvous brown.

The *Female* is pale earthy or light brown, with a fulvous supercilium extending to the nape and the lower parts less pure white; bill horny brown; legs dusky; irides light brown.

Length.—5·25 to 6 inches, wing 3, tail 2·25.

Hab.—Throughout India to the Himalayas, Ceylon, Assam and Upper Pegu; also Beloochistan, Persia and Afghanistan.

Passer salicicola, *Viell.*; *Roux. Orn. Prov.* t. 84; *Gould. B. Eur.* pl. 185,1; *Str. F.* i. p. 209; *Murray, Hdbk., Zool., &c., Sind.* p. 178; *Jerd. B. Ind.* ii. p. 364, No. 707. Passer hispaniolensis, *Tem.*—The Willow Sparrow.

Male.—Head and back of neck dark chestnut, the feathers edged paler; back sooty brown with whitish edgings; rump and upper tail-coverts pale brown; shoulder of wing chestnut with white borders to the lesser coverts, rest of the wing dusky with broad pale rufous brown edgings and a whitish bar formed by the tips of the greater coverts; secondaries edged and tipped whitish; tail dusky with pale edgings; lores, cheeks, and a narrow supercilium white, passing into ashy brown on the ear-coverts; beneath, the chin, throat and breast black, some of the feathers edged whitish; rest of the lower parts sullied white or whitish; the flanks and under tail-coverts with dusky longitudinal streaks.

Length.—5·75 inches, wing 3, tail 2.

The *Female* resembles that of the common House Sparrow, but the striation of the dorsal feathers is less strongly marked.—(*Jerdon.*)

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Persia, Afghanistan, Rajputana (Koochamun) and E. Turkistan.

Passer pyrrhonotus, *Blyth, J. A. S. B.* xiii. 946; *Jerd. B. Ind.* ii. p. 365, No. 709; *Murray, Hdbk., Zool., &c., Sind*, p. 178; *Hume and Doig, Str. F.* vol. ix. pp. 232, 280, 442.

Male.—Head and ear-coverts grey; back, rump, and patch behind the eye chestnut; throat stripe black; throat, back, lesser and median coverts chestnut; primaries, secondaries and tertiaries dull brown, narrowly margined with whitish or fulvous white; the primaries with a white spot at their base on the outer web forming a conspicuous wing spot; tail dusky, the feathers pale edged; beneath brownish white. The *Female* is not unlike that of the common House Sparrow. Bill dusky brown; legs pale fleshy brown.

Length.—5 to 5·25 inches, wing 2·75, tail 2·12, bill at front ·37.

Hab.—Sind. Breeds in the Narra districts.

Passer flavicollis, *Frankl.; Jerd. B. Ind.* ii. p. 368, No. 711; *Murray, Hdbk., Zool., &c., Sind*, p. 178.—THE YELLOW-THROATED SPARROW.

Male.—Head, neck, back, rump, scapulars and under tail-coverts pale earthy brown; a pale or fulvous supercilium, more distinct in females; chin white; throat-spot yellow; the rest of the under surface whitey brown, albescent on the vent and under tail-coverts; primaries and secondaries dull brown, the primaries edged paler and tipped whitish, as are also the secondaries; tertiaries broadly edged and tipped with fulvous; lesser wing-coverts chestnut; median and greater coverts dull brown, tipped fulvous white, forming two conspicuous wing bars; edge of the wing white; tail dull brown, the outermost feathers on each side paler. The *Female* wants the chestnut on the wing, and is more brown in colour beneath; the throat-spot too is less bright; upper mandible black, lower yellowish at the base; irides brown; legs pale brown.

Length.—5·5 inches, wing 3·4, tail 2, tarsus ·7.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Persia, Rajputana, Kutch (Kattiawar, Jodhpore) N. Guzerat, Deccan and Concan. Breeds in Sind during September and October.

Sub-Family, EMBERIZINÆ.

Bill flattened on the sides, smaller and more compressed than in *Passer*, the edges indented or waved—a palatal knob on upper mandible; wings pointed; tarsi moderate, scutate; hind toe longer than inner; tail moderate, even or emarginate.

Gen. **Emberiza.**

Bill small; second to 4th quills longest; tail rather forked; outermost feather white or whitish.

Emberiza huttoni, *Blyth, J. A. S. B.* xviii. 1849, p. 811; *Blf. East. Pers.* ii. 258; *Jerd. B. Ind.* ii. 373; *Hume, Str. F.* iii. 497; vii. 150; *Murray, Hdbk., Zool., &c., Sind*, p. 179. Emberiza cerrutti, *De F. Arch.* p. 7; *Zool. Genova*, ii. p. 383; *Viag. in Pers.* pp. 113, 349. Glycispiza huttoni, *Gould. Birds of Asia*, pt. xxi.—The Grey-necked Bunting.

Head, neck, nape, and sides of the neck grey; from the lower corner of the under mandible on each side a short streak of buffy, between which and the chin, which is also buff, is a streak of greyish, meeting the grey of the sides of the neck; orbital feathers whitish; back grey, with a slight rufescent tinge, the feathers faintly striated; rump and upper tail-coverts greyish brown, unstriated; breast and rest of lower surface reddish brown or ferruginous, paler on the abdomen and vent, and nearly buff on the under tail-coverts; lesser coverts ferruginous; median and greater coverts brown, edged with ferruginous; primaries dull brown, margined narrowly on their outer, and broadly on their inner web with pale white or rufescent white; secondaries the same, but the feathers also tipped with pale rufous; edge of the wing fulvous; tail blackish brown, the outer web of the outermost feather, except at the extreme base, and half of the inner web, white; the next outermost blackish brown on the outer web, and for nearly two-thirds its length on the inner web, blackish brown, the rest white on their *inner web only*; centre tail feathers edged with pale rufous; bill reddish; legs pale brown.

Length.—5·75 to 6 inches, wing 3½, tail 3, tarsi ·75.

Hab.—Sind, Punjab, N. W. Provinces, Central India, Beloochistan, Persia and Afghanistan. Occurs also in Kutch, Rajputana, Guzerat, Concan and the Deccan.

Specimens from Jeempeer and Jacobabad (Sind), and Quetta and Dozan (Beloochistan) have the chin and the streak above the greyish moustachial one unspotted buff, except in a single specimen from Dozan.

Emberiza stewarti, *Blyth, J. A. S. B.* xxiii. 215; *Gould. B. As.* pl. Emberiza caniceps, *Gould. B. As.* pt. vi. pl. 16; *Jerd. B. Ind.* ii. p. 375, No. 718; *Murray, Hdbk., Zool., &c., Sind*, p. 182.—The White-capped Bunting.

Male.—Forehead and crown greyish white; lores and a broad supercilium extending to the nape, black; chin and throat black; back, scapulars, rump, upper tail-coverts, flanks, and a broad band across the chest reddish chestnut; the feathers of the back in some specimens with

a mesial dark streak; cheeks and ear-coverts white; breast, belly and under tail-coverts greyish white or rufescent white; the under tail-coverts with dark mesial streaks; wing-coverts dark brown, edged with fulvous, or buffy brown; primaries and secondaries pale brown, the primaries edged whitish, and the secondaries fulvous brown; tail dark brown, the outermost feather on each side white on the outer web; the shaft dark brown, the white of the inner web running obliquely from about one-fourth its length at the base; the next like the outermost, but with the outer web dark brown, and narrowly edged with white. The *Female* is olive brown above, the feathers with dark mesial streaks; upper tail-coverts tinged rufescent; under surface fulvous or buffy brown, the feathers mesially streaked with dark brown; bill and legs pale brown.

Length.—6 inches, wings 3 to 3·1, tail 2·75, tarsus 0·7.

Hab.—Sind, Punjab, N. W. Provinces, N. W. Himalayas, Beloochistan and Southern Afghanistan. Uncommon in Sind, and occurs less abundantly in the Southern Districts during winter.

Emberiza striolata. *Licht.*; *Hume, Ibis.* 1869; 1870, p. 399; *id. Str. F.* vol. iii. 497; vii. 410; *Blanford, East. Pers.* ii. p. 258; *Murray, Hdbk., Zool., &c., Sind,* p. 179.—The Striolated Bunting.

"*Male.*—Forehead, top of the head and nape greyish white, grey or white in different specimens, each feather with a conspicuous linear, median black streak; a narrow, pure white superciliary stripe starting from the base of the bill and extending behind the eye over the ear-coverts, the lores and a moderately broad stripe directly behind the eye (and immediately under the white stripe), involving the upper portions of the ear-coverts black; below this another greyish white stripe, involving the rest of the ear-coverts; below this, starting from the base of the lower mandible, a greyish white stripe, which again is divided from the greyish white of the chin by a narrow inconspicuous dark streak. In the fresh birds in breeding plumage, all these streaks and stripes are as clearly and sharply defined as if painted; but at other seasons and in stuffed specimens, they are not so clear; the whole of the back, scapulars, and tertials are hair brown, the former two very broadly, the latter more narrowly margined with pale, more or less sandy, or even rufous brown; in many specimens the darker median streaks of the back feathers are reduced to mere lines, and in some, the rufous tinge on the upper back is well marked; the primaries and secondaries and their coverts are a mixture of hair brown, and rich rufous (recalling in colour the wings of *Mirafra erythroptera*) the extent of each varying in different specimens, but the brown predominating in the earlier primaries, and every where at the tips, and decreasing in extent in the hinder part of the wing and towards the bases of the feathers; the second primary for instance will be all brown, except a narrow rufous edging for the basal two-thirds of the outer web, and a broad rufous stripe on the margin of the inner web for the same distance, while one of the later secondaries will be all rufous, except a narrow brown stripe running down the shaft, till within one-third of the end of the feather,

whence it gradually widens so as to occupy the tip, and the whole of both webs; the rump and upper tail-coverts are much the same as the back, but in some specimens slightly more rufous than the lower back, and the longest of the coverts are in some specimens very narrowly tipped with very pale fulvous white; the tail is hair brown, darker than the brown portion of the quills; all the feathers externally very narrowly margined with pale rufous, except the external feather on each side, which has the whole outer web of that colour; the throat and upper breast are greyish white or grey, with more or less numerous and conspicuous black median stripes on the feathers. Specimens differ widely in this respect; in some the greyish white is a mere edging to dusky black feathers; in others only a few black spots, and streaks peep out of an almost unbroken grey, and this among specimens killed at the same time, and of apparently the same age; the lower breast and the whole lower parts of the body are pale greyish rufous, all the bases of the feathers (only seen if the tips are lifted) being a sort of bluish dusky; the axillaries, wing lining, and in fact the whole lower surface of the wings, except the points of the quills, a pale delicate salmon rufous."

"The *Female* only differs in being generally somewhat smaller, in having the white, grey, and black of the head, neck, throat and breast much duller (and in many specimens overcast with a sandy or pale rufous shade), the various stripes being less well marked and in having the dark spots and streaks of the throat and breast almost obsolete."

	Male.	Female.
Length	5·75 to 5·97	5·5 to 5·9
Expanse	9·37 „ 9·75	9 „ 9·5
Tail from vent	2·45 „ 2·75	2·2 „ 2·72
Wing from carpal joint to tip of longest primary	2·96 „ 3·1	2·87 „ 2·96
When closed reaching within 1·1 to 1·3	1·1 „ 1·7	of the end of tail.
Foot	1 „ 1·1	1·1 „ 1·17
Width	·63 „ ·8	·72 „ ·8
Bill at front	·36 „ ·39	·35 „ ·38

Legs and feet were in some pale waxy yellow, in some dingy, in some fleshy yellow, or yellowish fleshy. The feet especially at the joints more or less tinged with brownish; the claws rather pale brown; the bill had the upper mandible brown, in some blackish brown; the lower in some waxy, in some fleshy, and in some dingy yellow; irides brown.—("*Hume, Ibis,* 1869.")

Hab.—Sind, Punjab, N. W. Provinces, and Beloochistan, affecting sandy plains; also Rajputana, Kutch and Guzerat. In Sind, chiefly the barren hills, during winter.

Euspiza.—*Bp.*

Bill longer and stronger than in Emberiza, nearly conic and very slightly scooped at the tip; nostrils partly hidden by plumes; 2nd to 4th quills longest; tail slightly forked; tarsi and toes scutate.

Euspiza melanocephala, *Scop.*; *Veil. O. C.* t. 27; *Naum. vogt. Deutsch.* 101, 2; *Gould. B. Eur.* pl. 172. *Sykes, Cat.* 101; *Blf. East. Pers.* ii. p. 260; *Hume, Str. F.* iii. 497; *Murray, Hdbk., Zool., &c., Sind*, p. 182. Euspiza granativora, *Menet. Cat. Rais.* p. 40. Euspiza simillima, *Blyth, J. A. S. B.* xviii. 811.—THE BLACK-HEADED CORN BUNTING.

Male.—Whole head, feathers under the eye and ear-coverts black, in winter edged with yellowish or greyish brown; chin, throat, sides of the neck, and entire under surface bright yellow; sides of the breast chestnut; back and scapulars rich chestnut; rump and upper tail-coverts yellowish with a faint tinge of chestnut on some of the feathers; wing-coverts dark brown, the feathers edged and tipped with fulvous; primaries, secondaries and tertiaries brown, the primaries and secondaries narrowly, and the tertiaries broadly margined with fulvous; edge of the wing bright yellow; tail brown, the feathers edged paler. The *Female* is yellowish brown above, the feathers of the head and back with mesial dark streaks; the chin whitish, and the rest of the under surface very pale yellow; bill and legs yellowish brown; irides light brown.

Length.—7·5 to 8 inches, wing 3·8 to 4, tail 3, bill at front ·5, tarsus 1·0.

Hab.—Sind, Punjab (at Mooltan and Montgomery) Beloochistan, Persia, Afghanistan, Kutch, Kattiawar, Jodhpore, N. Guzerat, Concan and Deccan. Found outside of India, in Turkey, Asia Minor and S. E. Europe. Arrives in Sind in the middle of August and leaves in October.

Euspiza luteola, *Lath.*; *G. R. Gr. & M. Gen. B.* pl. 91; *Jerd. B. Ind.* ii. p. 379, No 722; *Hume, Str. F.* iii. p. 498; *Murray, Hdbk., Zool., &c., Sind.* Euspiza icterica, *Eversm. Gen. B.* pl. 9.—THE RED-HEADED BUNTING.

Head, neck, chin, throat and breast rich chestnut; sides of the breast greenish yellow; back and scapulars greenish yellow, the feathers mesially streaked with dark brown; the whole under surface including the under tail-coverts bright yellow; wing-coverts dark brown, broadly edged and tipped with fulvous; primaries, secondaries and tertiaries brown with fulvous edgings, broader on the tertiaries; tail brown, the outermost feather on each side much paler, and the rest edged with greenish; edge of the wing yellow. The females want the chestnut of the head, chin, throat and breast; the upper surface is olive brown, and the under surface very pale fulvous; bill and legs yellowish brown.

Length.—6·75 to 7, wing 3·5, tail 3, bill at front 0·5.

Hab.—Sind, Beloochistan, Persia, Afghanistan, E. Turkistan, Punjab, N. W. Provinces, Oudh, Kutch, Kattiawar, Jodhpore, Jeypore, N. Guzerat, Concan, Deccan and Southern India, also Khandeish and Central India.

Melophus.—*Sws.*

Head crested; upper mandible ridged, and slightly notched at the tip, otherwise as in *Euspiza*.

Melophus melanicterus, *Lath.*; *Gould. C. B.* pl.; *Jerd. 2nd Suppl. Cat.* 182; *id. B. Ind.* ii. p. 380, No. 724; *Hume, Str. F.* iii. 498; vi. 409; vii. 517; *Murray, Str. F.* vii. 113. Emberiza cristata, *Vig. P. Z. S.* 1831; (the female) Emberiza erythroptera, *Jard. and Selby, Ill. Orn.* pl. 132.—The Crested Black Bunting.

Entire head, neck, back, scapulars, rump, upper tail-coverts, chin, throat, breast, and under surface, including the under tail-coverts, glossy black, unglossed on the latter; lesser wing-coverts black; median and greater series, primaries, secondaries and tail dark cinnamon; the primaries, secondaries and tail feathers tipped dusky brown; bill pale brown, darkish on the upper mandible; legs reddish brown; irides dark brown.

Length.—6·5 inches, wing 3·25, tail 2·75, bill at front 0·5. The *Female* is dusky brown, the feathers edged paler; under surface ruf-escent white; wings duller or pale cinnamon.

Hab.—Sind, Rajputana, N. Guzerat, Concan, Deccan, Nepaul and Tenasserim; also Central and Southern India.

Sub-Family, FRINGILLINÆ; PYRRHULINÆ.—*Gray.*

Bill variable in form and size, thick, sloping to the sides, conical; tarsi moderate.

Gen. **Carpodacus**.—*Kaup.*

Bill tumid, rather longer than in *Pyrrhula*, and compressed at the tip, notched near its base; tail forked.

Carpodacus erythrinus, *Pall. Zoogr.* t. 36, 1; *Viell. O. C.* t. 65; *Naum vogt.* t. 113, 1, 2; *Gould. B. Eur.* pl. 206; *Bp. Lox.* t. 14; *Gray, Handlist B.* 7507, p. 101; *Blf. East. Pers.* ii. 2, 250; *Jerd. B. Ind.* ii. p. 398, No. 738; *Murray, Hdbk., Zool., &c., Sind*, p. 185.—The Common Rose-Finch.

Male, Winter Plumage.—Head, throat, breast, moustachial stripe, rump and flanks rose colour, brighter and deeper on the throat, head and breast; back and scapulars ruddy brown, roseate on the rump and upper tail-coverts; wing-coverts tipped with ruddy brown, forming two pale bars on the wings; tertiaries margined with pale brown; the quills and tail feathers with ruddy edgings. In summer the crown, throat, breast and rump become brilliant crimson. The *Female* is olive brown with dark streaks; the tips of the greater and lesser wing-coverts whitish, forming two conspicuous bands on the wings; below paler brown, albescent on the throat, the middle of the belly and under tail-coverts darker and somewhat streaked on the breast and flanks.—*Jerdon, B. Ind.* p. 398.

Bill yellowish brown; feet horny brown; irides light brown.

Length.—5·5 inches, wing 3·25, tail 2·25.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. Provinces, Oudh, Central India, Rajputana, Kutch, Guzerat, Concan, Deccan, and S. India.

Gen. **Bucanetes**.—*Cab.*

Bucanetes githagineus, *Licht. P. C.* 400; *Gould. B. Eur.* pl. 208; *Bp. Lox.* t. 33; *Descr.de'l Egypte*, t. 5·8; *Gray, Handlist B.* No. 7523, p. 102; *Blf. East. Pers.* ii. p. 250; *Hume, Str. F.* i. p. 210; vii. 64, 454; *Murray, Hdbk., Zool., &c., Sind*, p. 183. Carpodacus crassirostris, *Blyth, J. A. S. B.* xvi. 1847, p. 476.—The Desert Bulfinch.

"In the Male the head is pale bluish grey, the feathers tipped brown; the chin, throat, breast, cheeks, and ear-coverts a sort of blue grey, the feathers faintly tinged, most conspicuously so round the base of the lower mandible, with pale rosy; the abdomen, vent, and lower tail-coverts very pale rosy white, the longest of the latter with dark shafts; the back and scapulars dull earthy brown, with, when fresh, a faint rosy tinge, which disappears in the dried skin, and somewhat greyer towards the nape; rump pale brown, more decidedly tinged with rosy; the visible portion of upper tail-coverts rosy white, more strongly tinged with rosy at the margins, the centres and bases of the longest being pale brown; these however are not seen till the feathers are lifted; tail feathers dark brown, conspicuously, though narrowly, margined with rosy white, most rosy towards the bases of the lateral feathers; the wings hair-brown, conspicuously margined and tipped with pale rose colour, or rosy white; the coverts, secondaries, and tertiaries most broadly so. There is a very narrow, inconspicuous, pale rosy frontal band. The wing lining and axillaries are pure white; the winglet alone is dark brown, unmargined with rosy.

"The Female has the whole upper surface and the sides of the head and body a dull pale earthy brown, with only a faint rosy tinge upon the rump and upper tail-coverts; the lower parts a still paler earthy brown with the faintest possible roseate tinge on the breast and becoming albescent on the vent, lower tail-coverts and tibial plumes; the wings and tail are as in the male; but the margins are narrower and less conspicuous, and are pale brownish instead of rosy white.

"*Both Sexes.*—Bill at front 0·35 to 0·41; tarsus 0·67 to 0·77. The irides are brown; the legs and feet fleshy brown; claws dusky; soles whitish; the bill orange yellow, in some probably less mature, pale yellow, brownish on upper mandible.

"*Male, Length.*—5·7 to 6 inches, expanse 10 to 10·7, tail from vent 2·1 to 3, wing 3·3 to3·6, wings, when closed, reach to within 0·7 of end of tail.

"*Female, Length.*—5·7 to 5·8 inches, expanse 10·5 to 11·1, tail from vent 1·8 to 2, wings 3·2 to 3·4, wings, when closed, reach to within 0·6 to 0·8 of end of tail."—(*Hume, Str. F.* vi. 210, 211.)

Hab.—Sind, Punjab, Kutch, and Jodhpore, (Quetta) Beloochistan, Persia and Afghanistan. Winters in India; breeds in Persia and Afghanistan.

Serinus pectoralis.—*Sp. Nov.*

Male.—A dark brown nearly black streak at the base of the upper mandible, followed by a bright yellow frontal band, extending as a broad supercilium to behind the ear-coverts; a slaty grey streak

through the eye; crown of the head slaty grey, each feather with a dark central streak; nape greenish olive; back, scapulars and lesser wing-coverts yellowish green, the feathers with a dark mesial streak; median coverts dark brown, edged with yellow; greater coverts also dark brown, margined on their outer webs, and tipped with yellow; primaries and secondaries dusky brown, margined whitish on their inner webs, and edged on the outer very narrowly with greenish; rump olivaceous; upper tail-coverts yellowish, some of the lateral feathers with a dark mesial streak; chin, throat, breast and sides of the face bright golden yellow; a dark brown nearly black streak from each side of the base of the lower mandible extending to the sides of the neck, which is slaty grey; sides of the breast slaty grey with a narrow band issuing from each side, nearly meeting on the lower breast and forming a nearly complete pectoral band; rest of under surface yellow; tail dusky brown, the feathers slightly darker on their outer webs, and all tipped yellowish white on their inner webs; bill horny; legs dark fleshy; irides light brown.

Length.—4·93 inches, wing 2·62, tail 1·5, bill at front 0·31.

This pretty little species was got at Kurrachee, and is now alive in the possession of Mr. J. Strip, Assistant Collector of Customs, to whom I am indebted for having very kindly permitted me to describe it. It was captured in May 1881, having been struck by a catapult, and the wing so hurt, as to disable it from flying. It has been a captive since, and appears quite happy. A second one was seen by Mr. Strip shortly after on a mound near an abandoned well in one of the Kurrachee gardens. He says, that the bird in his possession is hardy and lively, and has an extremely pleasant song. It has outlived three canaries, and never yet appeared dull or ill, even when moulting.

It differs from *hortulana, canaria* and *aurifrons*, first in size, being smaller than the first two, and quite unlike in colour; and from Tristram's *aurifrons*, pl. 7, Ibis. 1868 in having no striations on the flanks, and from all the species I know, in having a nearly complete pectoral band, which is its chief characteristic. Tristram refers (l. c.) to *Bonaparte's S. syriacus*, which he says has a bright yellow forehead, light coloured back, and uniform yellow under surface without striations. It may possibly be this species, but there is no mention of the pectoral band, the slaty grey sides of the breast, and the dark streak at the base of the upper mandible. I therefore provisionally name it *pectoralis*.

Sub-Family, ALAUDINÆ,—Larks.

Bill more lengthened than in any of the *Fringillidæ*, the tip entire or obsoletely notched; tertiaries as long or nearly as long as the primaries; hind claw lengthened, straight or slightly curved.

Gen. **Mirafra**.—*Horsf.*

Bill thick, much compressed, the culmen curved and convex, the tip of the upper mandible wide above and inflexed; wings short, rounded; primaries scarcely longer than the secondaries and tertials; 1st quill short, half the length of the second, which is shorter than the third; tail short, even.

Mirafra erythroptera, *Jerd. Ill. Ind. Orn.* pl. 38; *id. Birds Ind.* ii. p. 418, No. 756; *Murray, Hdbk., Zool., &c., Sind*, p. 185.—The Red-winged Bush-Lark.

Head, back, scapulars, rump and upper tail-coverts fulvous brown; feathers of the head (coronal) lengthened, tinged rufescent and, like those of the upper parts, mesially streaked with dark brown; eye-streak and supercilium fulvous white; ear-coverts fulvous brown, very slightly tinged with rufescent; wing-coverts dusky brown, edged with fulvous or rufescent brown; primaries rufous on their outer webs, and dark shafted; the inner web of the second primary rufous for about one-half its length at the base, the other half dusky, the dusky tips growing less in extent on the others, and in some specimens reduced to a minute shaft-streak on the secondaries; tertials dusky brown, broadly edged with rufous; tail dark brown, the centre feathers pale sandy brown, with slightly rufous edgings, and the outer web of the outermost feather white; chin and throat white; sides of the throat fulvous white, the feathers edged brown, forming two bands from the base of the lower mandible to the sides of the neck; breast and under parts white or fulvous white, spotted with dark brown; bill horny; legs pale brown; irides light brown.

Length.—5·25 to 5·5 inches, wing 3·2, tail 2, bill at front 0·4.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Central India, Kutch, Kattiawar, Rajputana, Guzerat, Concan and the Deccan; affecting low jungle, bare plains, or the vicinity of cultivation.

Gen. **Ammomanes**.—*Cab.*

Bill as in the last, but longer and more compressed; 1st quill minute; 2nd shorter than the third, which, and the fourth, are equal and longest; tertiaries shorter than the secondaries; tail long; hind claw long and curved.

Ammomanes lusitania, *Gm. Syst. Nat.* ii. p. 798; *Hume, Str. F.* i. p. 211; *Murray, Hdbk., Zool., &c., Sind*, p. 185; *Gray, Handlist Birds*, No. 7808. Ammomanes lusitanica, (*Gm.*) *Jerd. B. Ind.* ii. p. 422, No. 759; *Tem. P. C.* 244, 2. Ammomanes deserti, *Licht.; Blf. East. Pers.* p. 245. Ammomanes isabellina, *Tem. Col. Pl.* 244, f. 2; *Gould. Birds Eur.* pl. 163.—The Pale Rufous Finch-Lark.

Top of head, nape, back, scapulars, rump and upper tail-coverts earthy greyish brown, slightly tinged with rufescent on the rump; feathers round the eye, as well as a line from the nostrils to the eye, and at the gape, fulvous white; a faint streak in front of the eye in the middle of the white line; cheeks and ear-coverts like the back; chin, throat and breast fulvous or greyish white, with a few dusky streaks on the breast; rest of lower surface rufescent brown; wing-coverts like the back, with paler edges and dark shaft-streaks; primaries and secondaries dusky, margined on the outer and inner webs with pale rufous, the tips fulvous white; tail brown; the outer web of the outermost, and its basal half, pale rufous, the others narrowly margined and tipped paler; bill dusky; base of lower mandible yellowish; legs pale brown.

Length.—6 to 6·25 inches, wing 4, tail 2·75, bill at front 0·56.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Arabia, Southern Persia, Afghanistan, Cashmere, Southern and Eastern Europe and N. E. Africa. Extremely common in Sind on the bare stony hills and plains.

Gen. **Pyrrhulauda.**—*Smith.*

Bill short, very stout, sides compressed; culmen arched; commissure straight; wings long; tertiaries lengthened; 1st primary small; tail moderate; toes small.

Pyrrhulauda grisea, *Scop.; Son. Voy.* t. 113, 2; *Jerd. B. Ind.* ii. p. 424, No. 760; *Hume, Str. F.* i. p. 212; *id.* vol. vii. p. 66; *Gray, Handlist B.* No. 7834; *Murray, Hdbk., Zool., &c., Sind,* p. 186. Pyrrhulauda crucigera, *Tem. Pl. Col.* 269, 1.—THE BLACK-BELLIED FINCH-LARK.

Male.—Forehead and cheeks white, or fulvous white; crown of the head, back, scapulars, rump and upper tail-coverts grey brown, with a slight tinge of rufescent on the back, the feathers centred dusky; cheeks whitish; primaries, secondaries and wing-coverts brown, the feathers edged paler; chin, throat, breast, sides of the neck and entire lower surface black, the flanks and sides of breast and abdomen greyish white; bill pale brown; legs fleshy; irides dark brown.

Length.—4·75 to 5 inches, wing 3, tail 2, bill at front 0·37. The *Female* is readily distinguishable by the absence of the black under surface and a more rufescent tinge on the upper

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Kutch, Kattiawar, Rajputana (Jeypore and Jodhpore) N. Guzerat, Concan, Deccan, Central and South India. Affects open plains and ploughed lands.

Pyrrhulauda melanauchen, *Cab. Mus. Hein.* i. p. 124; *Finsch. Trans. Zool. Socy.* vii. p. 275, pl. xxvi.; *Gray, Handlist Birds.* No. 7837; *Blf. East. Pers.* ii. p. 246. Pyrrhulauda affinis, *Blyth, Ibis.* 1867, p. 185; *Hume, Str. F.* i. p. 212; *id.* vii. p. 66; *Murray, Hdbk., Zool., &c., Sind,* p. 186.

"The male has a broad frontal band, cheeks, ear-coverts and a band from these round the base of the occiput and a large patch on either side of the breast, white; in the case of the two latter often tinged brownish.

"The base of the lower mandible, chin, throat, central portion of breast, abdomen, vent, and lower tail-coverts, axillaries and wing lining (except lower primary greater coverts, which are pale grey brown like the lower surface of the quills) intensely deep, at times somewhat *sooty*, at times almost chocolate-brown; the crown and upper part of occiput are deep brown, never quite so intense as the lower parts, often considerably lighter, and more purely brown; the anterior portion of the side of the neck behind the lower half of the ear-coverts is always like the breast, sometimes the deep colour of these parts extends behind the whole of the ear-coverts, and right round the back of the neck, forming a collar immediately behind the white basal occipital

band already noticed, sometimes there is not the faintest trace of this, and sometimes again the collar is only represented by a larger or smaller nuchal patch. This is perhaps the most common form, and hence the name *melanauchen*.

"The interscapulary region is a pale earthy brown, sometimes with a sandy tinge; the wings rather darker, but all the feathers margined with a pale whitey brown; inner webs of quills darker, a sort of pale hair-brown; central tail feathers slightly paler than tertiaries; rest of tail feathers deep brown, but the outer web of the exterior feather white or nearly so, and the inner half or more of the inner web pale whitey brown; rump and upper tail-coverts pale earthy or sandy brown, noticeably paler than the interscapulary region; flanks much the same colour as the rump.

"The female has the chin, throat, abdomen, vent, and lower tail-coverts white, with more or less traces of a very faint fawny tinge; a broad ill-defined pale fawny band, which is sometimes feebly striated darker, covers the breast. The axillaries and lesser lower coverts about the ulna are deep brown, sometimes almost as deep as the breast of the male.

"The female also wants the white frontal band and patch on the sides of the head, the white occipital band, the dark crown, and dark sides of the neck, and of course the dark collar or dark nuchal patch so common in the males; the whole top of the head is unicolorous or nearly so with the interscapulary region, though the feathers are generally feebly darker centred. The rest of the upper surface is much as in the male, but as a rule sandier and less earthy in tinge. The males are distinguished at once from those of *grisea* by their dark crowns. Both sexes are distinguished by their somewhat larger size. (Wings in *grisea* taken at random measure—*Males*, 3·08; 3·07; 3·0; 3·01; 3·1. *Females*, 2·99; 3·0; 2·9; 2·99; 3·06; 2·9; 2·87; 2·95,) and their somewhat larger bills. Females are further distinguishable by their whiter under surface, paler upper surface, and especially crowns, and by their deep coloured axillaries, which in *grisea* are little darker than the breast. In this latter species the lesser lower coverts about the ulna are dark brown in the female, but not nearly so deep as in *melanauchen*. Dimensions, as under:—

	Length.	Expanse.	Tail.	Wing.	Tarsus.	Bill at Gape.	Culmen.
Male.	5·61	10·1	2·2	3·2	0·6	0·5	0·55
„	5·6	10·0	2·2	3·17	0·7	0·47	0·56
Female	5·4	10·0	2·0	3·11	0·69	0·48	0·52
„	5·6	9·6	2·1	3·02	0·7	0·49	0·52

"The irides were brown; the bill varied from pale whitey brown, bluish on lower mandible to pearly white with a bluish tinge; the legs and feet were pale whitey brown, pale hoary fleshy or pale brownish fleshy."—(*Hume, Str. F.* vii. p. 64.)

Hab.—Sind, Kutch, Jodhpore, Rajputana generally, and in Jeysulmere; also in Beloochistan and Southern Persia, affecting ploughed lands and cultivation.

Gen. **Calendrella**.—*Kaup.*

Bill short, sub-conic; wings long; 1st primary minute; 2nd, 3rd and 4th equal and longest; tertiaries elongated, nearly as long as the primaries; feet small; toes and claws short; hind claw straight.

Calendrella brachydactyla, *Leisl.; Jerd. B. Ind.* ii. 426, No. 761; *Blf. East. Pers.* ii. p. 242; *Murray, Hdbk., Zool., &c., Sind*, p. 187. Alauda calendrella, *Bonelli. Naum. vogt.* t. 98, 2; *Gould. B. Eur.* pl. 163.—The Short-toed or Social Lark.

Head, nape, back, scapulars and rump pale rufous brown, the feathers with dark centres; upper tail-coverts paler, with fulvous edgings and dark shaft-streaks; supercilium fulvous white; chin and throat whitish; breast and rest of under surface fulvous white, with a brownish tinge on the breast, which in some is spotless, in others with a few faint brown spots; under tail-coverts white; wing-coverts, primaries, secondaries and tertiaries dusky brown, the outer margin of the first (2nd) long primary pale fulvous, and the secondaries and tertials with pale rufous edgings, broader on the tertials; edge of the wing pale white; tail dusky, with the outermost feather fulvous white, except an oblique dusky streak on the inner margin of the inner web; the next feather white on the outer web only, all the others, in some specimens tipped whitish, in others not tipped; central tail feathers with broad rufescent edgings; bill horny, dusky on the ridge of upper mandible to the tip; legs brown; irides dark brown.

Length.—6 to 6·25 inches, wing 4, tail 2·25, tarsus 0·8.

Hab.—Europe, Asia and Africa. Found throughout India to the foot of the Himalayas. Common in Sind, the Punjab, N. W. Provinces and Bengal; Kutch, Kattiawar, Rajputana generally, and North Guzerat; Khandeish and Central India, less numerous in parts of Southern India. In the Concans and Deccan it is extremely common, as also in Beloochistan, Persia, S. Afghanistan, and E. Turkistan. Breeds in Sind during April and May.

Gen. **Melanocorypha**.—*Boie.*

Bill thick and convex; tertiaries not elongated; hind claw moderate, straight.

Melanocorypha bimaculata, *Menet. Cat. Rais.* p. 37; *Sharpe, Ann. and Mag. Nat. Hist.* vol. viii. p. 180, Series 4, 1871; *Blf. E. Pers.* ii p. 244; *Hume, Str. F.* vii. p. 421; *Murray, Hdbk., Zool., &c., Sind*, p. 189. Melanocorypha calandra, *Rupp. Syst. Uebers.* p. 78. M. torquata, *Blyth, J. A. S. B.* xvi. p. 476; M. rufescens, *Brehm. Naum.* 1856, p. 376.

"*Adult Male in Summer Plumage.*—Above fulvous brown, the centres of the plumes much darker brown, giving a somewhat mottled appearance, all the feathers being edged with fulvous, especially on the hinder part of the neck and centre of the back; wing-coverts coloured like the back, but a little more rufous, plainly edged with fulvous, less distinct on the greater coverts; quills brown with a slight shade of ashy grey on the outer webs; all the feathers more or less nar-

rowly edged with fulvous, but none of the feathers tipped with white; tail dark brown, with conspicuous white tips to all the feathers except the two central ones; all the rectrices edged more or less broadly with fulvous; lores and a distinct eye-brow whitish; cheeks fulvous white with a slight mottling of rufous; ear-coverts entirely rufous; throat white; rest of the under surface dull white, the upper part of the breast and flanks rufous; a black pectoral gorget extending right across the lower part of the throat; on the upper part of the breast are a few indistinct mottled lines below the black gorget; under tail-coverts whitish; under wing-coverts entirely greyish brown; bill horn-brown, the under mandible yellowish; feet fleshy yellow; iris dark brown.

"*Obs.*—Some specimens are much greyer than others; others again are more rufous; some are more white on the belly and have the breast much obscured, so that the pectoral gorget is scarcely discernible. This last dress seems to be the winter plumage.

"*Young.*—Similar to the adult, but more rufous in the centre of the back; gorget more obscure, and the stripes on the upper breast more indistinct; the bill likewise seems to be more yellow."—*Sharp and Dresser, Birds of Europe.* (The males are larger than the female.)

Length.—7·06 to 8 inches, expanse 13·13 to 15·25, wing 4·2 to 4·8, 2nd primary is the longest, the 1st is subequal to 0·2 shorter, the 3rd is from 0·13 to 0·3 shorter, and the 4th 0·5 to 0·7 shorter, tail from vent from 2·12 to 2·4, tarsus 1 to 1·1. Bill from forehead to point 0·6 to 0·7, from gape 0·7 to 0·9, height at front 0·2 to 0·25, the closed wing fall short of end of tail by from 0·38 to 0·87.

"Legs and feet fleshy or yellowish fleshy, more or less dusky at joints; claws dusky; irides brown, in some light brown; bill horny brown or blackish horny on upper mandible; lower mandible greenish horny, changing to yellow at base and gape."—*Hume, Lahore to Yarkand.*

Hab.—Upper Sind, and the Desert East of Omercote, (*Blf.*) in the Thurr and Parkur Districts, Beloochistan, Persia, Afghanistan, and Eastern Turkistan.

Gen. **Alaudula**.—*Blyth.*

Bill less thick than in *Calendrella*, and more slender, very slightly curved; first three quills longest; tail even; hind claw small, straight.

Alaudula adamsi, *Hume, Ibis.* 1871, p. 405; *id. Str. F.* i. 213; v. 327; *Murray, Hdbk., Zool., &c., Sind*, p. 190.—The Little Sand-Lark.

The following is a description of the species by Mr. Hume:—

In the winter the whole upper surface is very pale grey or whitey brown, all the feathers narrowly centred with grey brown, so as to produce a striated appearance. There is in many specimens a more or less perceptible, but still very faint rufous tinge on the back. The wings are pale brown, the outer webs of the first primaries nearly entirely cream colour, the other primaries narrowly tipped and margined white; secondaries more broadly; tertiaries and coverts still more broadly margined with fulvous or slightly greyish white; the

central tail feathers brown, somewhat conspicuously margined with brownish or fulvous white; the exterior tail feather on either side wholly white, except a dark brown stripe down the inner margin of the inner web; the next feather with the whole exterior web pure white; interior web dark brown; other tail feathers dark brown, very narrowly margined with dull white; the lores and a stripe over and under the eye white or rufescent white; a very narrow grey line through the centre of the lores only noticeable in very good specimens or in the fresh bird; ear-coverts mingled grey brown and fulvous white, and usually exhibiting a somewhat darker spot just behind and below the posterior angle of the eye; the whole lower parts white, with, in some, a very faint rufescent tinge on breast, sides, and flanks, and with numerous narrow or linear darkish brown spots on the breast, very strongly marked, conspicuous in some specimens, reduced almost to speckles in other birds; the flanks and sides are faintly tinged with brown, or in some pale rufescent; the irides are pale brown; the bill pale greyish or slaty grey, brownish on culmen and the tip, slightly yellowish white at base of lower mandible; legs and feet fleshy brown, or in some brownish yellow, dusky on joints.

"*Male, Length.*—5·9 to 6·0 inches, expanse 10·4 to 11·0, tail from vent 2·1 to 2·2, wing 3·3 to 3·5, bill at front 0·35 to 0·38, tarsus 0·75 to 0·8, wings, when closed, reach to within 0·7 to 0·8 of end of tail, weight 0·75 oz.

"*Female, Length.*—5·6 to 5·7 inches, expanse 10 to 10·5, tail from vent 2, wing 3·05 to 3·2, bill at front 0·32 to 0·38, tarsus 0·75 to 0·78, wings, when closed, reach to within 0·6 to 0·7 of end of tail, weight 0·6 to 0·7 oz."

Hab.—Sind, Punjab, N. W. Provinces and Oudh, extending to the Himalayas. Resident in Sind, but nothing is known of its nidification.

Gen. **Alauda**.—*Linn.*

Bill cylindrical, conical or subulate; nostrils concealed; wings very long, no spurious quill; 1st, 2nd and 3rd primaries longest, tips of the lesser quill; marginate; tail forked, short or moderate; head crested.

Alauda gulgula, *Frankl. Proc. Zool. Soc.* 1831; *Jerd. B. Ind.* ii, p. 434, No. 767; *Hume, Str. F.* pp. 1, 40, 420, 485; *Murray, Hdbk., Zool., &c., Sind*, p. 192. Alauda leiopus, *Hodgs.*—The Indian Sky Lark.

Head, nape, back, scapulars, and rump dark brown, margined with fulvous; crest moderately long; eye-streak pale fulvous; ear-coverts dusky with a few brown spots; upper tail-coverts like the back, tinged slightly with rufous; wing-coverts brown, edged with greyish; primaries and secondaries brown, with rufous or fulvous margins on their outer webs; tail dark brown, outermost feather on each side fulvescent white, except a faint dusky margin on the inner margin of the inner web, the next with the outer web only fulvescent; chin, throat, breast and rest of under surface fulvescent white, deeper on the breast and streaked with dusky; bill horny brown, pale beneath; legs fleshy brown; irides dark brown.

Length.—6 to 6·5 inches, wing 3·25 to 3·75, tail 2·25, bill at front 0·37 to 0·5.

Hab.—Throughout India to Cashmere and Nepaul; Sind, Kutch, Rajputana, N. Guzerat, Concan, Deccan, Beloochistan, Afghanistan, Punjab, N. W. Provinces, Cashmere.

Gen. **Galerida.**—*Boie.*

Bill lengthened, curved slightly; wings with the first primaries partially developed, next four sub-equal; head crested.

Galerida cristata, *Linn.; Gould. B. Eur.* pl. 165; *P. E.* 503, i. *Naum. vogt.* t. 99, i.; *Jerd. B. Ind.* ii. p. 437, No. 769; *Blf. East. Pers.* ii. p. 240; *Hume, Str. F.* i. 214; vii. 185; *Murray, Hdbk., Zool., &c., Sind*, p. 191.—The Large Crested Lark.

Head, nape, back, scapulars, rump and upper tail-coverts pale sandy or pale rufous brown; the feathers of the crest, and in some specimens, of the forehead also, with a mesial dark brown streak; the back and scapulars with dark shaft-stripes; a pale fulvous streak from the nostrils to above the eye as a supercilium; lores pale fulvous or fulvous white, with, in some specimens, a faint dusky streak in the centre, in front of the eye; feathers below the eye whitish, followed by curved dusky line, then white, and followed by a dusky streak at the base of the lower mandible on each side; chin, throat, sides of the neck and breast white; abdomen, flanks, and under tail-coverts sullied white; breast with longitudinal streaks or oval spots; ear-coverts pale brown; wings pale brown; the wing-coverts edged and tipped pale rufous, also the primaries, secondaries and tertiaries, and all with a broad rufous or pale salmon margin on their inner web, the under wing-coverts and wing lining being of this hue; tail dusky or dark brown, the centre feathers broadly margined with rufescent, or mixed rufescent and dusky, the outermost feather on each side rufescent, or rufescent white, except a dusky wash on the inner web; the next margined with rufescent white on the outer web, forming a tip of the same colour, and running up and forming a very narrow edge on the inner web for one-half the length of the feathers (this is not constant), rest of the tail feathers very narrowly tipped with rufescent white; bill yellowish dusky on the ridge of the upper mandible; legs pale brown; irides dark brown.

Length.—7 to 7·5 inches, wing 3·75 to 4·25, tail 2·25 to 2·75, bill at front 0·75.

Hab.—Universally distributed from sea level to nearly 8,000 feet above the sea; S. E. Europe, Asia, Africa, throughout India, Persia, Beloochistan, and Afghanistan. Like *A. gulgula* it rises in the air to a great height, soaring up to the sun, often so high, that the eye cannot follow it, all the while singing, as it advances higher and higher, as if springing up into the higher regions. This is chiefly noticed during the breeding season (April and May). It however descends rapidly, but continues its song till within a few feet of the ground. As remarked by Mr. Hume, this species is variable in size and colouration, so much so, that at least half a dozen species have been made by Franklin,

Sykes, Jerdon and Blyth. "The examination of a large series," Mr. Hume says, "proves that it is impossible to draw a line anywhere between the largest and the smallest examples. A perfect series of the wings occurs, and as for the difference in tone of plumage, big and little examples are alike met with amongst the brown, rufous, sandy, grey or desert colour types."

Gen. **Certhilauda**.—*Sws.*

Bill slender, lengthened, longer than in *Galerida*, more or less curved; nostrils naked; wings long, first quill spurious, next three sub-equal; tail moderate or long, even; hind claw variable.

Certhilauda desertorum, *Stanley; Gould. Eur.* pl. 168; *Tem. Pl. Col.* 393; *Jerd. B. Ind.* ii. 439, No. 770; *Hume, Str. F.* i. 216; *Blf. East. Per.* ii. p. 240; *Murray, Zool., &c., Sind*, p. 192; *Gray, Handlist*, No. 7794; *Rupp. Abyss.* pl. 5. Certhilauda doriæ, *Salv. Atti. R. Acad. Sci. Tor.* iii. 1868, p. 292.—The Desert Lark.

Head, nape, back, scapulars and rump isabelline or pale earthy grey, slightly tinged with fulvescent on the back and scapulars; upper tail-coverts pale brown, edged with whitish; supercilium, a small patch under the eye, chin and throat white; ear-coverts fulvous white; a spot in front of the eye, another behind the eye just above the ear-coverts, and a streak from the gape, dark brown; feathers of the breast dusky or dark brown, edged and tipped with white; the lower breast with a few dark brown oval spots; sides of the breast isabelline or pale earthy grey, tinged with fulvescent; rest of under surface, including the vent and under tail-coverts, white; primaries and their coverts dark brown, nearly black; the primaries basally white, and their coverts margined and tipped with white; first primary pale brown, very short; second twice its length, and a third shorter than the third; secondaries white, dark brown on the middle of each feather, the dark brown broadest on the first secondary of the sixth quill, and decreasing obliquely in extent on the next and following, towards their bases, till on the last it forms a small spot; tertiaries fulvescent, broadly shaded in the middle along the shaft with dusky, and all with obsolete dusky transverse barrings; wing-coverts pale brown, edged with fulvescent; edge of the wing and under wing-coverts white; tail dark brown, graduated; the centre feathers fulvescent, shaded with dusky or pale earthy brown, the outermost on each side margined on the outer web and tipped white, the next very narrowly margined and tipped whitish, and the rest with very faint margins of fulvescent, and all with obsolete dusky transverse barrings; bill horny, darker on the ridge and yellowish white at the base of the lower mandible; irides brown; legs China white.

Length.—9 to 11 inches, wing 5 to 5·45, tail 3·75 to 4·2, bill at front 1·1 to 1·2.

Hab.—S. E. Europe, N. Africa, Arabia, Sind, Punjab, N. W. Provinces, Beloochistan, Persia and Afghanistan. Inhabits desert places and sandy tracts.

Tristram has an interesting account of this species in vol. i. of the 'Ibis,' p. 427. It runs with great rapidity and is never found congregated in flocks. Mr. Hume (*S. F.* i. 216) says "they never apparently fly if left undisturbed, but run about with their little porcelain white legs twinkling in the sunlight, hither and thither, for all the world like miniature coursers." Tristram however says "he has watched it in the early morning, rise perpendicularly to some elevation, and then suddenly drop, repeating these gambols uninterruptedly over exactly the same spot for nearly an hour. Except in this there is nothing of the lark in its flight."

ORDER, GEMITORES,—Pigeons.

Bill short, straight, compressed, front half of mandible vaulted and curved at the tip, the base with a soft fleshy membrane, in which are the nostrils; wings moderate or long; tail variable, of 12,14,16 feathers, even or rounded; tarsi strong.

Family, TRERONIDÆ,—Fruit Pigeons.

Bill variable, short, thick, or slender; tip vaulted; tail of 14 feathers; tarsi more or less feathered, the bare portion reticulated.

Sub-Family, TRERONINÆ,—Green Pigeons.

Bill strong and thick; tail short; tarsi stout; feet broadly padded; colour leaf green, generally varied with maroon and ashy.

Gen. Crocopus.—*Bonap.*

Characters those of the Sub-Family; basal portion of bill with the fleshy protuberance occupying one-half its length or nearly as much; third primary sinuated on its inner web.

Crocopus chlorigaster, *Blyth, J. A. S. B.* xvii. p. 167; *Jerd.* iii. p. 448, No. 773; *Str. F.* ii. 423; *Murray, Hdbk., Zool., &c., Sind*, p. 193; *Tem. Pig.* t. 2. C. jerdoni, *Strickl.*—The Southern Green Pigeon.

Forehead, crown and nape ashy grey, as also are the lores, sides of the face and ear-coverts; neck behind yellowish green, followed on the upper back by a narrow band of ashy grey; back, scapulars, rump and upper tail-coverts green, slightly tinged with yellowish on the scapulars; primaries dusky brown, margined on their outer web with pale yellow; the wing-coverts broadly margined with the same colour, forming an oblique wing bar; shoulder of wing lilac; tail above greenish at base and ashy grey for the terminal half nearly; the under surface black at the base and albescent for less than the terminal half; under tail-coverts dull maroon, the feathers broadly tipped with white; chin and throat greenish yellow; neck in front, breast and abdomen bright yellow, tinged greenish on the flanks; vent mixed green and white; bill whitish; legs and feet yellow; irides carmine.

Length.—11·75 to 12·5 inches, wing 7, tail 5, bill at front 0·75.

Hab.—Nearly throughout the Peninsula of India and Ceylon (*Jerd.*) Malabar Coast, Madras and Southern India generally; Khandeish, the Deccan, Sind, Rajputana and North Guzerat. Rare in Sind, and has only been found on the frontier, at Jacobabad.

Sub-Family, PALUMBINÆ,—Wood Pigeons.

Characters same as those of the last (Treroninæ); tail feathers 12 only; tarsi short; tail longer and more rounded.

Gen. **Palumbus.**

Characters those of the Sub-Family; the distinguishing feature is the patch on each side of the neck.

Palumbus casiotis, *Bonap. Ic. Pig.* t. 58; *Jerdon, Birds of Ind.* iii. p. 464; *Murray, Hdbk., Zool., &c., Sind,* p. 193.—The Himalayan Cushat.

Head, lores, sides of the face, chin and throat bluish ashy; nape, hind neck, and sides of the neck glossed green and purple, the latter predominating on the upper back and sides of the breast; neck patch on each side pure fulvous or yellowish clay; scapulars and tertials dusky or hair brown, lighter on the latter; breast dull lilac or ruddy vinaceous, paling on the upper abdomen to a vinous ash; lower abdomen, vent and under tail-coverts ashy white; rump bluish ash; primaries and their coverts dusky, nearly dark brown; the primaries and some of their hindmost coverts margined with white on their exterior web; secondaries bluish ash, the tips dusky; wing-coverts dark ashy; the lower series white on their outer web, and forming a longitudinal patch; winglet dark brown; tail dark ashy grey at the base, followed by a broad light ashy grey band, and a broad black tip; the under surface much darker, and the central band nearly white; bill orange at the tip, whitish at the base; legs red.

Length.—17 inches, wing 10·25 to 10·5, tail 7.

Hab.—Nepaul, N. W. Himalayas, Sind, Punjab, Persia, Beloochistan, and S. Afghanistan. Found in Sind on the frontier only, at Jacobabad.

Gen. **Palumbæna.**—*Bonap.*

Palumbæna eversmanni, *Bp.; P. C. Pig.; Jerd. B. Ind.* iii. p. 467, No. 787; *Hume, Str. F.* i. 217; *Murray, Hdbk., Zool., &c., Sind,* p. 193.—The Indian Stock Pigeon.

Dark ashy, with a whitish grey rump; crown and breast tinged with vinaceous, two or three black spots on the wings, forming the rudiments of bands, and the end of the tail black; its outermost feather white for the basal two-third of its exterior web, or showing a black, and then a narrow grey band towards its tip; beneath the wings whitish, where it is dark ashy in the European bird; bill yellowish translucent; legs with a yellowish tinge; skin round the eye yellow; irides buff.

Length.—11½ inches, expanse 24, wing 8, tail 4.—"*Jerdon.*" I have only a single specimen of this species from Shikarpoor, and in a very

unsatisfactory state for describing. Jerdon says this species is found in Western and Central India, and is probably migratory.

Columba intermedia, *Strickl.; Jerd. B. Ind.* iii. p. 469, No. 788; *Hume, Str. F.* i. 217; vi. 419; *Blf. East. Pers.* p. 268; *Murray, Hdbk., Zool., &c., Sind*, p. 193.—THE BLUE ROCK PIGEON.

Head, nape, chin, abdomen, vent and upper and under tail-coverts dark slaty grey; back, scapulars, secondaries, tertials, inner webs of primaries and rump pale ashy, paler on the rump; the outer web of the primaries dusky grey, as are also their tips; secondaries broadly tipped dusky, the innermost tertials and greater wing-coverts with a subterminal black patch on the outer web only, forming two black wing bands; neck all round and breast glossy, changeable green and amethystine, in varying lights; throat also slightly tinged with glossy green; under wing-coverts white; tail like the upper tail-coverts, or a little paler for two-thirds its length, then broadly black, with a very narrow terminal ashy tip; the basal two-thirds or more of the outer web of the outermost feather white; bill black; cere whitish; irides dull orange; legs pinkish red.

Length.—12 to 13 inches, wing $8\frac{3}{4}$ to 9, tail 5, bill at front 0·75.

Hab.—Throughout India to Ceylon, the Himalayas, Assam, Burmah, Persia, Beloochistan and Afghanistan in great abundance, congregating in large flocks.

Columba livia, *Bp. Pig.; Pl. En.* 510. *Naum. vogt.* t. 150; *Tem. Pig.* t. 12; *Gould. B. Eur.* pl. 245; *Gray, Handlist Birds*, No. 9231; *Blf. East. Pers.* p. 268; *Hume, Str. F.* i. 218; vii. 296; *Murray, Hdbk., Zool., &c., Sind*, p. 193.—THE ROCK DOVE.

Differs from *C. intermedia* in having a *pure white* instead of an ash coloured rump.

Hab.—S. E. Europe, Sind, Beloochistan, S. Persia and S. Afghanistan.

The following is a description of a specimen obtained 17 miles south of Sukkur, which provisionally I would call *Columba intermedia*, var. *atra*:—

In every character like *Intermedia*, except that the primaries are a dark grey externally, tipped dusky and irrorated with white on their inner webs near the shafts, and pale whitish grey for their basal two-thirds; the primary coverts dark brown, nearly black on their outer webs, dark ashy grey on their inner; shoulder and edge of wing pale grey; lesser, median and greater coverts dark brown, nearly black, the feathers tipped narrowly with ashy white; outer webs of secondaries dark brown, nearly black, broady tipped on their inner webs, also of the same colour; the rest of inner web irrorated greyish white, and all, very narrowly edged round the tip of the feathers with pale white; scapulars like the secondaries, with pale white shaft-stripes broadening at the tip; rump mixed pale grey and white; upper tail-coverts slightly darker than in *intermedia* or *livia*; middle of abdomen greyish white, mixed with slaty; under surface of wing bluish ashy; axillaries white.

Length.—15 inches, wing 9 inches, tail from vent 7·2, tarsus ·87, bill at front 0·75.

This was got from among a large flock of *Columba livia* and *intermedia*, feeding on a barren plain.

Sub-Family, TURTURINÆ.—*Bonap.*

Bill lengthened, slender, the base soft and tumid; wings long; feet short; feathers of the rump rather rigid.

Gen. **Turtur**.—*Selby.*

Bill slender; wings long, 2nd and 3rd quills longest; tail moderate, rounded or graduated; tarsi scutellated in front, naked; outer toe shorter than the inner.

Turtur senegalensis, *Linn.*; *Lev. O. A.* t. 270; *Tem. Pig.* t. 45; *id. Descr. Egypt*, t. 9, 3; *Gray, Handlist Birds*, No. 9317; *Blf. East. Pers.* p. 270; *Hume, Str. F.* vii. 463. Turtur cambayensis, *Gm.*; *Jerd. B. Ind.* iii. p. 478, No. 794; *Murray, Hdbk., Zool., &c., Sind*, p. 193. Columba maculicollis, *Wagler*. Columba Ægyptiaca, *Lath.*—The Little Brown Dove.

Head, nape, lores and sides of the face pinkish vinaceous, as are also the sides of the neck, throat and breast gradually shading to paler on the upper abdomen, and white or fulvous white on the lower abdomen, vent and under tail-coverts; chin white; sides with a patch of black and dark rufous feathers; back and scapulars brown, the latter with a slight rufous tinge; primaries and their coverts dusky brown, first three quills edged with fulvous white; secondaries darker brown than the primaries, slightly edged and tipped with pale grey; wing-coverts pale grey, the edges of the feathers lighter; rump, upper tail-coverts and central tail feathers like the back, the others black at the base and white for nearly their terminal half; edge of the wing and under wing-coverts dark ashy; bill black; irides dark brown with a white inner circle; legs lake red.

Length.—10·5, wing 5, tail 4·5.

Hab.—Nearly throughout India, Sind, Kutch, Rajputana, Deccan, Concan, Punjab, N. W. Provinces, Southern India generally, Beloochistan, Persia and Afghanistan. In Central and Western India specially abundant.

Turtur suratensis, *Gm.*; *Tem. Pig.* t. 43; *Jerd. B. Ind.* iii. 479, No. 795; *Str. F.* v. 231, 409; *Gray, Handlist* No. 9315; *Murray, Hdbk., Zool., &c., Sind*, p .194. Turtur tigrina, *Tem.*—The Spotted Dove.

Forehead greyish white; crown, nape, breast and upper abdomen pale vinaceous, darker on the breast, paling on the lower abdomen and flanks, and albescent on the under tail-coverts; chin and throat white; patch on the neck black with narrow rufous tips; back and scapulars isabelline brown, or rufous brown, the feathers with dark shaft-stripes broadening into a nearly triangular spot at the tip, on each side of which, especially on the scapulars and wing-coverts, is a pale rufous or

vinaceous spot; in some specimens scarcely a spot, but with this colour edging the feathers; edge of the wing, and the lower series of wing-coverts near it, greyish white, with faint dark shaft-stripes; primaries and secondaries dusky brown, the first three quills, and some of the secondaries, edged with pale or greyish white; primary coverts dark brown; tail with the central feathers brown, the outermost black at the base, and tipped white for the terminal half, and the others with the white tips decreasing in extent; bill blackish; irides hazel, surrounded by a reddish sclerotic membrane; legs reddish.

Length.—12 inches, wing 5·5 to 5·75, tail 5·5, graduated.

Hab.—Throughout India nearly, to Ceylon and the Himalayas. Replaces the last on the Malabar Coast and in Lower Bengal. Jerdon says it is rare in the bare Carnatic land, the Deccan and N. W. Provinces. Uncommon in Upper Sind, but less so in Lower Sind. Breeds in April and May. It occurs, but less abundantly, in Rajputana and N. Guzerat.

Turtur risoria, *Linn.*; *Pl. En.* 244; *Tem. Pig.* t. 44; *Gray, Handlist,* No. 9328; *Jerd. B. Ind.* iii. 481; *Str. F.* i. 218; vii. 297; *Blf. East. Persia,* p. 270; *Murray, Hdbk., Zool., &c., Sind,* p. 194.—The Common Ring Dove.

Head pale greyish brown, with a vinous tinge; the forehead albescent; nape and neck pale vinaceous; collar black, a narrow line of white before and behind it; back, scapulars and innermost tertiaries grey brown, as also are the rump and upper tail-coverts; primaries and their coverts dusky brown; the primaries margined narrowly with whitish, and their coverts tinged with greyish; edge of the wing, lower series of the median coverts and greater series also pale grey; under wing-coverts greyish white; chin and throat albescent; breast and upper abdomen, also the sides of the neck and breast pale vinaceous; flanks, lower abdomen, vent, thigh and under tail-coverts ashy grey, the latter with whitish tips; tail with the central feathers like the back; outermost feather on each side narrowly margined with greyish white on their outer web, with a broad black band about the middle, greyish at base, and broadly terminated with white, which on the others increase in extent; bill black; irides crimson; orbital skin whitish; legs pinkish.

Length.—12 to 13 inches, wing 6·5, tail 5, bill at front 0·81.

Hab.—India generally, except the more moist regions, as the Malabar Coast; abundant in Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Concan, Deccan, Central and South India, also Beloochistan and Southern Afghanistan.

Turtur humilis, *Tem. Pl. Col.* 258, 259; *Knip. Pig.* t. 7; *Str. F.* i. 218; iv. 292; *Jerd. B. Ind.* iii. p. 482; *Murray, Hdbk., Zool., &c., Sind,* p. 194. Turtur tranquebaricus, *Herm. Obs. Zool.* p. 200; (ex tranquebaria, 1804).—The Red Turtle Dove.

Male.—Head and nape ashy grey, also the lores and sides of the face slightly paler on the forehead; collar black, set off by whitish before and behind it; back, scapulars and wing-coverts brick red,

slightly paler behind the black collar; chin whitish; throat, breast and entire lower surface pale vinous red, white on the vent and lower tail-coverts; rump and upper tail-coverts deep slaty; primaries, their coverts and secondaries dusky brown; the margin of the primaries, as also the margins and tips of the secondaries, whitish; primary coverts slightly tinged with vinous red on their outer webs; edge of the wing greyish, some of the dark bases of the median coverts showing through; tail with middle feathers ashy brown, the others greyish black at the base, and broadly tipped with white; the under surface black and pure white, outermost feathers on each side white on the exterior web; bill black; irides dark brown; legs purplish red.

Length.—9 inches, wing 5·5 to 5·75, tail 3 to 3·25. The *Female* is duller in colour on the back, being more of an earthy brown and much paler below; *length* 8·5 to 9 inches, wing 5 to 5·25.

Hab.—The dryer regions in India, to Ceylon and the foot of the Himalayas. Common in the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Concan and Deccan, but less so in Sind. Occurs also in Assam and Northern Burmah. In Sind it effects the northern districts chiefly, seldom seen below Sukkur. It is not known from S. Afghanistan, where *T. senegalensis* no doubt replaces it.

ORDER, RASORES,—Gallinaceous or Game Birds.

Bill usually short, vaulted, more or less arched and bent down at the tip; nostrils situated in a membrane at the base of the bill; wings usually short; tail variable in length and form; tarsi long and strong, often spurred; hinder toe short and elevated from the ground.

Family, PTEROCLIDÆ,—Sand or Rock-Grouse.

Bill short, curved to the tip and compressed at the sides; wings long and pointed; tail long and pointed; tarsi feathered; hind toe small.

Gen. Pterocles.—*Tem.*

Bill small, rather stout; culmen curved, sides compressed; nostrils at base partly covered by membrane; wings long, 1st and 2nd primaries longest; tail with the median rectrices sometimes lengthened beyond the rest; tarsi short, feathered in front and on the inner side.

Mr. D. G. Elliott has a very clear and exhaustive paper on the *Pteroclidæ* Family in the Proceedings of the Zoological Society of London, 1878, pp. 233, 264, giving the literature of the Family, its classification and a review of the geographical distribution, as well as a key and descriptions, with the synonomy of each species. The following key is extracted from the paper referred to, and refers only to those species found in Sind:—

A. "Without pectoral band.

(*a*) Stripe on each side of forehead from nostril to above the eye; chin and centre of throat black...*P. coronatus.*

(b) Lores and band encircling back of head pearly grey; cheeks, ear-coverts and throat orange yellow; centre of abdomen black.....*P. senegallus.*

B. With pectoral band.

(a) Without black bar on forehead.

(a') Median rectrices not lengthened beyond rest; upper part of throat and sides of neck rufous; lower portion of throat black; band on lower part of breast, abdomen and flanks black .....*P. arenarius.*

(b') Median rectrices greatly lengthened beyond the rest.

(a)″ Throat yellow; black band across breast; abdomen and flanks chestnut .....*P. exustus.*

(b'') Throat and stripe behind the eye black; sides of throat rufous; centre of breast chestnut, bordered above and below with black; rest of under parts white .....*P. alchata.*

(b) With black bar on forehead.

(a') Breast uniform greenish buff.

(a'') Throat pale buff; upper part of breast buff, crossed with numerous narrow black bars; middle of breast uniform buff, crossed in the centre by a narrow black bar and another of the same hue on its lower edge; rest of under parts yellowish white, barred narrowly with black .....*P. lichtensteini.*"

Pterocles coronatus, *Licht. Verz. d' Doubl.* p. 65; *Tem. Pl. Col.* No. 339, 340; *Heugl. Syst. Ueber. N. O. Afr.* p. 304; *Ibis.* 1864, pp. 27, 240; *id.* 1870, pp. 9,16; 1871, p. 144; *Str. F.* i. p. 224; *id.* (1876); iv. p. 230; *Blf. East. Pers.* ii. p. 272; *Murray, Hdbk., Zool., &c., Sind,* p. 200; *Elliott, P. Z. S.* 1878, 282.—The Coronated Sand-Grouse.

Male.—A line on each side of the forehead from the nostrils to above the eye black, and a pale fulvous one between these from the point of the forehead. Crown of the head pale chestnut, vinous or rufescent fawn. A pearly grey band from the anterior angle of the eye, continued as a supercilium and extending round to the nape;* lores and a narrow band edging the black chin and throat stripe white; sides of the face, ear-coverts and the neck all round orange buff; base of the neck and upper back isabelline, the feathers edged dusky grey; interscapulars the same, with median buffy spots at the tips; rump and upper tail-coverts a dark or dirty grey, mixed with the fulvous of the base of the feathers; tail with the median rectrices of a pale vinous colour, dark shafted, with a subterminal dark spot, and very narrowly tipped with white; lateral feathers deeper vinous with also a subterminal dark bar, and broadly tipped with white; all the feathers with a few dusky sprinkles behind the dark band; primaries and their coverts dull grey or dusky

* In two specimens I possess there is a distinct pearly grey band across the forehead immediately behind the termination of the black forehead stripes.

brown; all the primaries, except the first three, broadly margined with fulvous white obliquely towards the tips on their inner webs, and also slightly tipped the same; secondaries hair brown; tertiaries vinous on their inner webs and edged on the outer with buffish; scapulars vinous at the base, dark shafted, with a subterminal dark band, and mesially tipped with a nearly oval buff spot; median wing-coverts the same; the greater series greyish buff or buffy isabelline; abdomen, flanks, under wing-coverts, vent and lower tail-coverts white, slightly soiled on the middle of the abdomen, and in some specimens a pale isabelline; tarsal plumes white.

The *Female* has the throat and sides of the neck orange buff; the chin paler and nearly albescent; the crown very pale cinnamon; entire upper surface buff, with, in some specimens, a vinous tinge and barred with numerous crescentic and broken bands of dark brown; breast and under parts paler buff, also with crescentic bands; the flanks albescent; scapulars largely blotched with dusky, and with buff tips; primaries and secondaries as in the male, but very pale or hair brown.

Length.—11·75 to 12 inches, wing 7 to 7·75, tail 3·75, bill at front 0·45.

Hab.—Sind, Persia, Beloochistan, Afghanistan, N. W. Arabia, Egypt and Nubia. Breeds in the Southern portions of the Sahara, where it is said to replace *P. arenarius*.

Pterocles senegallus, *Lin. Mantissa.* 1771, p. 526; *Lath. Ind. Orn.* vol. ii. p. 642; *Gray, Gen. B.* vol. iii. p. 519; *Tristram, Ibis.* 1860; *Str. F.* i. p. 221; iii. pp. 418, 4; v. 231; *Murray, Hdbk., Zool., &c., Sind,* p. 197. Pterocles guttatus, *Licht. Verz. d' Doubl.* Pterocles senegalensis, *Shaw, Nat. Misc.* vol. iv. pl. 933, *Shelley, Ibis.* 1871, p. 144.—The Spotted Sand Grouse.

"The male has the whole chin and throat with a patch extending upwards from the throat, towards, but not quite meeting on, the back of the neck, bright buffy yellow or orange buff; lores, forehead, a broad stripe over the eye continued round the nape and the back of the neck, pale blue grey, dull and tinged fawny in some specimens; crown, occiput, and nape, a sort of dove colour or pale, slightly rufous fawn; back and rump a somewhat similar, but more sandy colour, in many specimens more tinged with fawn; the upper tail-coverts buffy yellow, all, but the longest, obscurely tipped with a somewhat pinkish mouse colour. They are more or less pale dove colour at their bases, which colour however is not seen till the feathers are lifted. The central tail feathers have the pointed tips black, in many specimens more or less tinged hoary buffy, and the rest of the visible portion yellowish buff, but the bases, as may be seen on lifting the feathers, are greyish; the lateral tail feathers are a greyish brown at base, dark shafted, with conspicuous white tips, and broad blackish brown subterminal bands; the primaries are pale isabelline, the shafts conspicuous and black; they have broad ill-defined subterminal brown bands, beyond which there is a narrow paler tipping, and they are pretty conspicuously margined

on their inner webs towards the tips with still paler isabelline. The first primary has the outer web browner, the others have the outer webs, especially toward the bases, a brighter isabelline. The whole visible portions of the lesser coverts and of the primary greater coverts are yellowish fawn, or isabelline, varying much in shade in different specimens; these greater coverts are dark shafted, and with a brownish tinge next the shafts on the inner webs; the scapulars bluish grey at the bases, tipped broadly, but chiefly on the outer webs, with buffy yellow, and the lesser ones tinged immediately above the yellow with a somewhat brownish purple, or dull greyish vinaceous. The secondary, median, and greater coverts like the lesser scapulars, but showing more of the vinaceous hue. The secondaries are brown, lighter towards their bases. The lower part of the neck in front and upper breast are nearly the same blue grey or greyish fawn as the back of the neck; the lower breast, abdomen, sides, flanks, axillaries, and wing lining isabelline or desert colour; the upper abdomen often with a faint orange buffy tinge. A broad irregular deep brown patch runs down the centre of the abdomen to the vent; the lower tail-coverts are greyish brown at their bases, but are broadly tipped with white (often tinged buffy or isabelline) which is the only colour visible until the feathers are lifted. The lower surfaces of the quill shafts are white.

"The female has the yellow chin and throat patch like the male, but paler; the lores and feathers immediately encircling the eye pale isabelline white; the whole upper parts and the neck all round pure isabelline, tinged slightly rufous on the occiput, nape, and back, and conspicuously spotted with dull, somewhat greyish, black; the spots on the forehead and front part of the head are small and irregular; on the nape and occiput they are more or less arranged in rows (so as to produce more of a striated appearance) and in a band running from behind the eye round the nape, they are very much more densely set; on the upper tail-coverts they are larger; while on the scapulars they take the form of double spots or irregular bars. The primaries and their greater coverts are much as in the male, but paler; the central tail feathers are isabelline, dark shafted, the points greyish black, and the rest of the feather with narrow, transverse, irregular bars of the same colour on both webs; the lateral tail feathers are much as in the male, but have the basal portions more tinged with isabelline, and more or less imperfectly barred. The breast, abdomen, and wing lining are as in the male, but somewhat purer and paler; the abdominal patch is narrower and perhaps also somewhat paler.

"Irides brown, bare; orbital skin yellowish; bill pale plumbeous, bluish grey, or bluish white, always somewhat more dusky towards the tip; feet pale plumbeous or bluish white, paler towards the tips of the toes; weight 8 to 12 ounces, but averaging about 10 ounces.

"*Male, length.*—13·4 to 14·7 inches, expanse 23 to 23·7, tail from vent 5·3 to 6, wing 7·5 to 7·9, the wings when closed reach to within from 2·3 to 2·8 of the end of the longest tail feathers, viz., the central ones which exceed the others by from 1·75 to 2, bill at front 0·44 to 0·47, tarsus 1 to 1·05.

"*Female, length.*—12·4 to 13·1 inches, expanse 22 to 22·6, tail from vent 4 to 4·6, the central tail feathers only extending from 0·75 to 1·2 beyond the rest, wing 7·3 to 7·5, bill at front 0·4 to 0·44."—*Hume, Str. F.* i. 219.

Common throughout Rajputana, Kutch, Kattiawar, Guzerat and the Punjab. Breeds in the Province. Like the preceding species it is found in N. Africa, also in N. W. Arabia, and in Beloochistan.

Pterocles arenarius, *Pall. Nov. Comm. Petrop.* vol. xix. p. 418; *id. Rosso. As.* ii. p. 73; *Lath. Ind. Orn.* ii. p. 642. Pterocles arenarius, *Tem. Pig. et Gallin.* vol. iii. p. 240; *id. Pl. Col.* No. 52, 53; *Gray, Gen. B.* iii. p. 518; *P. Z. S.* 1858, p. 501; *Ibis.* 1859, p. 352; 1860, p. 69; *Jerd. B. Ind.* iii. p. 496; *Str. F.* i. 219; iii. 418; iv. 179; *Blf. East. Pers.* ii. 271; *Murray, Hdbk., Zool., &c., Sind*, p. 194.—THE LARGE SAND GROUSE.

"Forehead and crown greyish brown, with a faint pearly tinge, in some specimes with a buffy tinge; lores, behind the eye and ear-coverts light grey, in some specimens, especially old males, the dark shafts of the feathers of the lores, under the eye, and of the ear-coverts are distinctly visible and end in bristles; nape and base of the neck, like the crown; back, scapulars, upper tail and wing-coverts rich buff or orange buff with a subterminal dark bar, the bases of the feathers paler buff, with waved barrings and vermiculations; primaries greyish and black shafted, the outer web of the outermost quill dark brown, and with the two following tipped blackish, the rest the same, but edged on the tip and the outer edge of the inner web near the tip, with whitish, the under surface black; the secondaries basally white or fulvous white, with faint vermiculations on their exterior webs, all broadly tipped dusky, and the margin of the exterior web blackish; tertiaries dusky grey, or buffish, with vermiculations basally, and margined at the tips on the exterior web with rich buff or orange buff; the visible portion of the lower series of the median and greater coverts rich buff or orange, forming in the closed wing, with the outer edges of the tertiaries, an oblique bar of rich buff; edge of the wing fulvous white; under wing-coverts pure white; chin, upper throat, sides of the neck to behind the ear-coverts and nape deep chestnut; middle of the throat with a large triangular patch of black; breast dull ashy or pearly grey, crossed on the lower part by a broad black band, succeeded by a broad buffy one, about four times the width of the black band; abdomen, vent and thigh-coverts deep black; under tail-coverts black, tipped with white; tail with the central tail feathers like the back, or orange buff, with numerous dark bands, and slightly elongated beyond the others; lateral feathers dusky rufescent, with darker narrow bars, tipped white, and with a subterminal black band; tarsal feathers fulvous white; bill bluish; feet dull yellowish brown; irides dark brown.

"*Length.*—11·75 to 12·5, wings 9·25, tail 4 to 4·25, tarsus 1·1.

"The female differs in having the whole head and upper parts, and also the breast, narrowly barred with brown. The pectoral band is narrower and the chin fulvous with a narrow black edge."

Hab.—The desert regions of Asia, Southern Europe and North Africa; Asia Minor and Palestine. Every where common in Sind, Punjab, N. W. Provinces, Oudh and Bengal; Kutch, throughout Rajputana, Kattiawar and North Guzerat; Beloochistan, Persia, Afghanistan and Eastern Turkistan.

Pterocles exustus, *Tem. Pl. Col.* Nos. 354, 360; *Rupp. Les. Trait. Orn.* p. 517; *Sykes, P. Z. S.* 1832, p. 154; *Gray, Gen. B.* iii. p. 519; *Jerd. Madras Journ.* xii. p. 3; *Handlist, Syst. Orn. W. Afr.* p. 205; *Jerd. B. Ind.* iii. p. 502; *Hume, Str. F.* vii. 160; *Elliott, P. Z. S.* 1878, p. 248; *Murray, Hdbk., Zool., &c., Sind*, p. 202.—The Common Sand Grouse.

Head and nape, sides of the neck and breast isabelline with a faint fulvous tinge; lores, sides of the face, chin and throat yellowish or light orange buff; back and rump like the breast, the feathers with darker tips; scapulars tipped greyish fulvous; upper tail-coverts with a greenish cast; primaries dusky brown, all, except the four outermost, broadly white on their inner margins near the tip, the innermost also tipped white; secondaries hair brown, their terminal third with buffy edges on their exterior webs; tertiaries the same, but with narrower buff edgings; wing-coverts buff, the feathers tipped narrowly with blackish chestnut; tail with the central feathers much elongated beyond, the rest slightly darker buff than the wing-coverts, black-shafted, the lengthened narrow portion black; lateral feathers dusky rufescent, with pale rufous bars on their exterior webs, tipped white and with a subterminal dark band; a narrow black pectoral band, occasionally edged on its upper side with fulvous white followed by a broad band of isabelline; rest of the under parts chocolate brown, paler on the vent; the flanks and thigh-coverts chestnut; lower tail-coverts creamy or fulvous white; tarsal plumes fulvous or yellowish white.

The female has the entire upper plumage, as also the space between the pectoral band and abdomen, fulvous, closely barred with deep brown; breast unspotted isabelline, like the male.

Length.—10 to 11·5 inches, wings 7, tail 3·5. The males average from 9·5 to 10 in length, bill leaden brown, legs brown, irides dark brown.

Hab.—N. E. Africa, Arabia, Nubia, Egypt, Abyssinia and Palestine; Sind, Kutch, Rajputana, Kattiawar, N. Guzerat and Deccan; Punjab, N. W. Provinces, Bengal, Sylhet, Burmah, Beloochistan, Quetta and Afghanistan.

Pterocles alchata, *Linn. Syst. Nat.* i. p. 276; *Gmel. Syst. Nat.* i. 754; *Lath. Ind. Orn.* ii. p. 641; *Licht. Verz. Double.* p. 64; *Jerd. B. Ind.* iii. p. 500, No. 801; *Hume, Str. F.* i. p. 221; *Blf. East. Persia*, ii. p. 271; *Murray, Hdbk., Zool., &c., Sind*, p. 197; *Elliott, P. Z. S.* 1878, 251. Pterocles setarius, *Tem. Pig. et Gallinæ*, iii. pp. 256, 714.—The Pin-tailed Sand Grouse.

Male.—Forehead and crown, also the nape and sides of the face yellowish buff with a ferruginous tinge; the crown with some nearly obsolete dark bars; chin, throat and a streak behind each eye black;

neck in front and upper breast greenish buff, the feathers above pale chestnut, of the breast with a dark brown transverse band forming a bar across; lower breast pale chestnut, the feathers ashy white at base, with a subterminal dark or dusky bar, and broadly terminated with chestnut; a black band separates the chestnut breast from the white of the abdomen; hind neck olive brown; upper back the same, each feather tipped with yellow; lower back, rump and upper tail-coverts pale buff, with, in some, a rufescent tinge, barred transversely with black. Scapulars rufescent or orange buff, the feathers barred with black and tipped with yellow. On some feathers this yellow tip is subterminal, with a very narrow black margin at the extreme tip; shoulder of wing olive brown; lesser, median and greater coverts broadly maroon, bounded above and below with a narrow white line, and tipped narrowly with black, the bases of the feathers being brownish ash. The upper series of the median and greater coverts olive brown at base, then broadly greenish yellow and margined with black at the tips. Primary coverts brownish ash, black-shafted. Primaries black-shafted, all (except the outer web of the first which is black) with their outer webs ashy grey, their inner webs rufescent grey near the shaft (not extending to the tip) then broadly dusky brown, and narrowly margined to the tip with white; secondaries with their outer webs and tips of the inner webs dusky brown, rest of the inner web and edging to the outer web white. Tertiaries greenish olive on their outer web and rufescent grey on their inner, the uppermost with a yellow spot terminally; abdomen, flanks and axillaries white, the shafts of the feathers, except those of the axillaries, black basally; a large white patch on the under surface of the wing, formed by the white bases of the inner webs of the secondaries and their coverts; the edge of the wing inside dusky brown; tarsal plumes whitish; tail with the lateral feathers white on their outer webs, their inner webs grey brown, margined with narrow, nearly obsolete dusky and buff bars, the tips of the feathers broadly white; rest of the tail feathers barred buff and dark brown, plain grey brown near the shaft, and all (except the longest rectrices, which are black) tipped with white; bill horny; orbits dark plumbeous; irides dark brown.

Length.—To end of longest rectrices 13 inches, wing 8, tail 6 to end of longest rectrices.

Female.—Top of head and back deep buff, barred with black; sides of face and neck orange yellow; throat and chin white. One dark band on the lower neck, another on the upper breast, and a third on the lower breast separating the white of the abdomen. Upper plumage barred black and buff; secondaries the same, with a subterminal grey bar.

Length.—13 inches, wing 7·75, tail 5·37, irides and orbits as in the male.

Hab.—Sind, Punjab, N. W. Provinces and Rajputana; Beloochistan (in the Bolan, Quetta and at Khelat) Persia, at Bushire, Southern and Eastern Afghanistan and Eastern Turkistan. It also inhabits N. Africa, Palestine, Spain and Portugal, and is said to breed in parts of Western

Asia. In Sind, in especially the Northern districts, the Pintail is found in flocks, and sometimes in countless numbers; in the Southern parts it is also found, but evidently only as stragglers.

Pterocles lichtensteinii, *Tem. Planch. Col.* 355-361; *Heuglin, Syst. Uebers. Vog. N. Afr.* p. 304; *Speke, Ibis.* p. 247; *Hume, Str. F.* i. p. 219; *Murray, Hdbk., Zool., &c., Sind*, p. 195. *Butbur*, Sind.—The Close-barred Sand Grouse.

Male.—Frontal zone white, or buffy white; a broad black semicircular band behind it extending from the anterior angle of the eye on each side; behind this another white or buffy white band, interrupted on the crown, the feathers of which are buffy white and mesially dark brown; a buff spot above the hinder angle of each eye; chin and throat pale buff, their sides the same, with minute black spots; upper breast, hind neck and back pale or fulvous white, with regular and close barrings of black; scapulars, wing-coverts and tertiaries the same, the black transverse bars rather broader and deeper in colour, the tips of the feathers broadly yellowish buff; upper tail-coverts fulvous white, the black bars more distant and as wide as the fulvous interspaces; primaries and their coverts hair brown, the outer web of the first margined with dull white, more conspicuous basally, and some of the inner ones with white margins to the tips; secondaries dark brown; lower breast yellowish buff with a narrow black band crossing it in the middle and another on the lower part of the breast, formed by the dark termination of the lowest breast feathers; below this the abdomen, flanks, vent and under tail-coverts are white, with transverse brown bars; tarsal plumes buffy white; tail barred buff and black, the terminal black bar broadest, with a streak running up the shaft of the feathers and partially dividing the broad buffy tips.

The *Female* wants the frontal patch and the semicircular band behind it, also the buff breast and band crossing it in the middle; the chin and throat are pale buffy, minutely spotted with dark brown; the upper surface of the body finely, closely and narrowly barred with pale fulvous and dark brown; the lower surface the same, but the fulvous interspaces are broader and the dark bars narrower; bill horny; feet yellow; irides brown; orbits lemon yellow.

Length.—10 inches, wing 7·25, tail 3·25, bill 0·62.

Hab.—Sind, Punjab, Arabia, N. E. Africa.

Family, PHASIANIDÆ.

Sub-Family, PAVONINÆ,—Pea-Fowl.

Pavo cristatus, *Linn.*—The Common Peacock.

This bird is too well-known to need a description. Introduced in Sind.

Family, TETRAONIDÆ,—Partridges.

Bill generally short and thick; wings short and rounded in most; tail short; tarsus short and strong; face feathered usually with a small bare patch over or round the eye.

Sub-Family, PERDICINÆ.

Tarsus bare; orbits not naked; tarsus generally spurred.

Francolinus, *Steph.*—Bill very slightly curved at tip; tail of fourteen feathers, even or rounded; tarsi of male with blunt spurs.

Francolinus vulgaris, *Steph. Jerd. B. Ind.* p. 558; *Murray, Hdbk., Zool., &c., Sind*, p. 202; *Gould. B. Eur.* pl. 259. Tetrao francolinus, *Linn.*—THE BLACK PARTRIDGE.

Male.—Top of head black, the feathers behind edged with rufescent brown; lores, chin, throat and neck in front black; nape and hind neck black, each feather with four white spots, two on each side of the shaft, the lower of which near the tip showing through; a streak under the eye to the ear-coverts white; a chestnut red collar round the neck; upper part of the back black, also the scapulars, the smaller feathers with four roundish spots, two on each side of the shaft, and the longer ones with six rufescent marks, two tranverse and a longitudinal streaks on each side of the shaft, the longitudinal ones only showing from under the feathers; middle and lower back, rump and upper tail-coverts barred with black and white; wing-coverts black, edged with rufescent; quills barred with rufous and black; tail black, the middle feathers barred like the back with black and white, the rest barred at their bases only; breast, abdomen and flanks deep black, the feathers of the flanks with 3—4 white spots, the hinder ones near the vent with broad white tips; thigh and under tail-coverts and feathers round the vent chestnut; bill black; irides brown; legs reddish.

Length.—13 to 14 inches, wing $5\frac{1}{2}$ to $5\frac{3}{4}$, tail $3\frac{1}{2}$.

The *Female* wants the black head and neck of the male and the rufous collar. It is generally much browner in colour.

Caccabis, *Kaup.*—Bill red, slightly longer than in *Francolinus*; tarsi of male with a blunt spur; a small bare patch behind the eye.

Caccabis chukor, *Gray, Ill. Ind. Zool.* pl. 54; *Gould. C. B.* pl. 71; *Jerdon, B. Ind.* p. 564, No. 820; *Murray, Hdbk., Zool., &c., Sind.* p. 203.—THE CHUKORE PARTRIDGE.

Above pale bluish or olive ashy, with a rufescent tinge on the back; sides of the face, chin and throat fulvous, pale chestnut or rufescent, encircled by a broad black band from the forehead, through the eye along the side of the neck on to the breast, meeting its fellow from the other side and forming a large pale chestnut or rufous pectoral gorget; a pale white line behind the eye; ear-coverts chestnut; sides of the lower mandible and chin with a black spot; breast bluish ashy, slightly tinged with rufescent; abdomen and under tail-coverts buff, the flanks from the axil deeper buff, each feather ashy at the base with two dark bands, the interspace of which is buff and terminated broadly with chestnut; wings concolorous with the back, the ends of all the primaries, except the first, margined to nearly the tip on their outer webs with buff, some of the secondaries also; axillaries buff. Tail rufous, except the central feathers, which are concolorous with the back.

Length.—14—15·75 inches, expanse 21 to 23·25, wing 6·25 to 6·8, tail 4 to 4·8. The female is slightly smaller; *length* 13 to 14·25, resembles the male, and wants the spur.

Hab.—Throughout the Himalayas to Afghanistan. Common also in Beloochistan, Sind, Punjab Salt Range, Persia and along the Arabian Coast. Breeds from May to July in Chaman (S. Afghanistan) making a nest composed of a little grass under the shelter of grass tufts or bushes. The normal number of eggs is 12, but as many as 14 and 16 have been taken from a single nest, all varying in size and shape, from peg-tops to elongated ovals. The colour is also variable, but typically is a pale *café au lait* ground colour, with brick red specklings.

Gen. **Ammoperdix**.—*Gray*.

Bill reddish; wings long; tarsi not spurred.

Ammoperdix bonhami, *Gray, Des. Murs. I. O.* t. 29; *Gould. B. As.* pt. ii. pl. 4; *Jerdon, B. Ind.* iii. p. 567; *Str. F.* i. 226; *Murray, Hdbk., Zool., &c., Sind*, p. 203.—The Seesee Partridge.

Male.—Head and cheeks dull grey; forehead, a streak through the eye and a border to the ear-coverts black; lores and ear-coverts silky white, rufous behind; throat greyish white; breast vinaceous or vinous fawn; sides of the neck spotted with white; upper parts isabelline or pale brownish, freckled with dusky; rump and upper tail-coverts like the back, with darker markings; primaries isabelline on their outer webs, finely pencilled with dusky, and all, except the first, with broad whitish bands or bars; tail brownish, tinged with chestnut, the tips of the feathers freckled with dark brown; legs and feet dingy yellow; irides bright or orange yellow; bill orange; cere orange red.

Length.—9 to 11 inches, wing 4·75 to 5·75; tail 2·5. *Female* slightly smaller, has not the dull grey crown of the male, and in general is more brownish throughout; the black markings on the head are replaced by freckles of dusky or black and white, and the entire upper and lower surface of the body is mottled.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan and Afghanistan, also Persia. Numerous throughout Upper Sind, also in Beloochistan, where in the early morning, especially on broken ground and on the road in the Bolan, as many as two or three hundred may be met with, feeding on the droppings of cattle, or, in its absence, on grass seeds along the hill sides. Breeds in the Punjab, Beloochistan and Afghanistan in April and May.

Gen. **Ortygornis**.—*Reich*.

Bill long, and much curved at the tip; legs red; tarsi spurred, 1—2.

Ortygornis ponticeriana, *Gm.; P. C.* 213; *Gr. Ind. Zool.* pl. 56; *Jerd. B. Ind.* iii. p. 569; *Murray, Hdbk., Zool., &c., Sind.* p. 203.—The Common Grey Partridge.

Forehead, over the eyes, lores, nape and face rufous, the face with dusky freckles; top of the head olive brown; ear-coverts rufescent brown; back, scapulars and wing-coverts dark chestnut, each feather with two or three transverse buffy bars, bordered with black on both sides; feathers of the rump and upper tail-coverts similar, but olive brown instead of chestnut; tail feathers rich chestnut or deep ferruginous

with a broad subterminal dark brown, nearly black band, tipped with pale or yellowish white; central tail feathers like the back beneath, the chin and throat are white or creamy, encircled from the base of the lower mandible with dark spots, forming a gular patch; breast and entire lower parts creamy white, or very pale buff, the feathers with transverse dark bars; lower tail-coverts ferruginous. The female is like the male, but paler in colour, and wants the spur.

Length.—11·5 to 13·5 inches, wing 5·5 to 6, tail 3·35 to 4, legs bright red, irides brown, the orbital ring with a row of minute white feathers, bill dusky brown.

Hab.—Throughout India and Beloochistan. Breeds in April and May.

Gen. **Coturnix.**—*Briss.*

Bill short, straight, very slightly curved at the tip; tarsi not spurred; tail short; wings long and pointed; 1st and 2nd quills longest.

Primaries with pale rufous bars on their outer webs. *C. communis.*

Primaries without pale rufous bars on their outer webs. *C. coromandelica.*

Coturnix communis, *Bonn.; P. E.* 170; *Gould. B. E.* pl. 263; *Jerd. Birds. Ind.* iii. p. 586. No. 829; *Str. F.* vol. iv. p. 447; *Murray, Hdbk., Zool., &c., Sind*, p. 203.—The Large Grey Quail.

Top of head brown, the feathers edged paler; a mesial buffy line on the crown; supercilium pale yellowish white, reaching above the ear-coverts, which are partially brown; lores and a line below the eye white; sides of the neck white; two narrow blackish lines from the sides of the neck to below the throat, the interspace being white; the upper black band not always perfect; chin and throat patch dark brown; breast pale buff, buffy white or rufous, with pale shafts to the feathers; sides of the breast and flanks similar or deeper in colour, with pale shafts; abdomen white, pale rufous, or buff; back, scapulars and upper tail-coverts from brown to a rich dark brown, each feather shafted a rich rufous, or buff, with three transverse bars or bands of the same colour on each side, the tips being pale buff; *primaries dusky brown with pale rufous bars on their outer webs;* the secondaries with pale tips, and the tertials barred buffy on both webs, the borders of the buffy bars darker than the ground colour of the feathers. The female is like the male, but wants the central throat patch, and the breast is spotted with brown or dark brown. She is also much larger.

Length.—7 to 8 inches, wing 4 to 4·5, tail 1·6 to 2·25, irides brown or hazel, legs pale fleshy, bill blackish with a brownish horny tinge above and at the tip.

Hab.—Sind, Punjab, Beloochistan, Afghanistan, the Deccan, N. Guzerat, Rajputana, Kutch, Kattiawar and India generally to Nepaul. In Sind it is a visitant in July, remaining till November, specially common in August and September.

Coturnix coromandelica, *Gm.; P. E.* 35; *Gould. B. As.* pl. 7; *Jerdon, Birds Ind.* iii. p. 588. No. 830; *Murray, Hdbk., Zool, &c.,*

Sind, p. 203. Coturnix textilis, *Tem. Pl. Col.* 35. (*Chota Buttayr*, Sind.)—The Black-breasted Rain Quail.

Male.—Top of head brown, with a longitudinal pale stripe on the crown; supercilium white, extending above and beyond the ear-coverts; a white streak under the eye, followed by a dark brown one, which meets the first dark brown stripe running below the throat, and forming with its fellow on the other side a triangle, from the middle of which to the chin runs a broad throat stripe; a triangular patch of white on each side of the throat; there is also on the throat a second dark stripe behind the first, running down to the breast, the interspace between both being white; breast with a large jet black patch, some of the feathers of the lower part of which are edged with pale buff or white; sides of the breast dark rufous, the feathers pale shafted, and a few with dark spots on the both webs; flanks and abdomen pale buff and white intermixed, the feathers black shafted; lower tail-coverts and vent rufous; back, scapulars and upper tail-coverts same as in the large grey quail, from which it may be readily distinguished *by the absence of rufous bars on the first two primaries*, the first primary having a pale outer edge and by the well-defined lines on the chin and throat, and the patch on the breast, also by its much smaller size.

Length.—6·25 to 7 inches, wing 3·43 to 3·7, tail 1 to 1·5, irides dark brown, legs and feet pale fleshy, bill dusky black.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Beloochistan, Persian Gulf, Rajputana, N. Guzerat, Kutch, Kattiawar, the Deccan and South India. Rain Quail visit the Province during the monsoon months, about the end of July, and remain to breed. They leave about the endof October.

Family, TINAMIDÆ.

Bill short, rather slender, and very slightly curved at the tip; tail short or none; tarsi not spurred; hind toe small or wanting.

Gen. Turnix.

Characters the same as those of the Family; nostrils linear; 1st quill longest; no hind toe.

Turnix joudera, *Hodgs. Beng. Sport Mag.* 1838, pl. 1, 2; *Jerd. B. Ind.* iii. 599, No. 834; *Str. F.* vi. p. 453; *Murray, Hdbk., Zool., &c., Sind*, p. 203.—The Indian Button Quail.

Male.—Top of head light brown with a faint longitudinal streak on the crown; back of neck, back and scapulars ferruginous brown, the feathers behind the head with dark spots, and those of the back, scapulars and under tail-coverts with narrow transverse striæ, distinct on the lower part of the back; scapulars with a few white spots or edgings to the feathers; wing-coverts pale earthy brown, the tips broadly white, each with a dark ocelli in the centre; primaries pale earthy brown, narrowly edged with pale white; chin and upper throat white; middle of breast ferruginous, the sides of the breast like the scapulars, with white tipped feathers, in the middle of which is a dark spot; under parts ferruginous; vent whitish.

Length.—5·5 to 6 inches, wing 2·75, bill at front 0·43.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Deccan, South India; Kutch, Kattiawar, N. Guzerat, Rajputana and Punjab during the rains; rare in the Deccan and sparingly distributed in Bengal; affects chiefly large open grassy plains; occurs also in South Travancore, and probably in Ceylon.

Turnix dussumieri, *Tem. P. C.* 454, 2; *Gould. B. As.* pl.; *Jerd. B. Ind.* iii. p. 600, No. 835; *Murray, Hdbk., Zool., &c., Sind*, p. 204. Turnix variabilis, *Hodgs. Beng. Sport. Mag.* 1837, p. 347. (*Chota Buttayr*, Sind.)—The Little Button Quail.

Male.—Head brown, barred with black, and with a central longitudinal yellowish stripe; supercilium pale white or yellowish white; back and scapulars chestnut brown, the feathers with fine dark transverse striæ, and edged with yellowish white; rump and upper tail-coverts dark brown, closely barred with black, the feathers with whitish edges; throat white, with a few dark spots on the sides; breast pale ferruginous, the feathers on the sides with dark spots or lunules; abdomen whitish.

Length.—5 to 5·5 inches, wing 2·75, irides light yellow, legs and feet pale fleshy.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, and the Concan during the monsoon, in grassy plains or cultivated fields. In the Deccan it is very numerous and difficult to flush from the fields of pulse which it affects. Said to breed in the Himalayas and N. W. India.

ORDER, GRALLÆ,—Waders or Shore Birds.

Tarsi long, rounded; tibia bare to a greater or less extent; hind toe imperfect in most; wings long.

Trib e, PRESSIROSTRES.—*Cuvier.*

Hind toe small or moderate; bill depressed at base, and rather compressed on the sides.

Family, OTITIDÆ.

Bill compressed, the tip scooped, and slightly curved; nostrils in a membranous groove, partially closed; wing, 2nd to 4th quills longest; tertials nearly as long as the primaries.

Gen. **Eupodotis.**—*Less.*

Bill long, pointed, straight, the tip curved; legs long and strong; male with a pouch; wings ample.

Eupodotis edwardsi, *Gray, Ill. Ind. Zool.* pl. 59; *Gould. C. B.* pl. 72; *Jerdon, B. Ind.* iii. p. 607; *Murray, Hdbk., Zool., &c., Sind*, p. 204. (*Tokdar*, Sind.)—The Indian Bustard.

Male.—Top of head and crest black; sides of the face, neck all round, breast and entire lower parts white; the feathers of the breast and lower part of the neck long and hackled, those of the breast covered with minute dusky mottlings; a dark band across the breast; back, scapulars, wing and upper tail-coverts brown, pale buff, or grey brown, beautifully mottled and vermiculated with minute black striæ; primaries snuff brown, darker on their inner webs, and tipped with white; some of the inner ones with 3—4 white patches on their inner webs; secondaries slaty, much irrorated basally, and broadly tipped with white; tertials as long as the primaries, concolorous with the back, also the lesser wing-coverts; median coverts black, tipped with white; greater wing-coverts slaty grey, also tipped with white. Tail like the back with a subterminal dark band and tipped with white; flanks and sides dark brown, mixed with whitish or dark olive brown; vent and lower tail-coverts the same as the back, with white tippings to the feathers.

Male.—*Length* 45 to 50 inches, expanse of 85—95 inches, wing 24·5 to 29.

Female.—*Length* 36 to 38 inches, wings 20 to 22, legs and feet creamy yellow, irides yellow, bill yellowish at tip, dusky at the base.

Hab.—Sind (Thurr and Parkur), Punjab. N. W. Provinces, Kutch, Rajputana, N. Guzerat, Kattiawar, Jodhpore, Hydrabad Deccan, Poona, Sattara, Berars, and the Central Provinces. According to Mr. Doig, (*Hume, Game Birds*) it is a permanent resident and breeds in the Thurr and Parkur districts. It is said to wander occasionally in the cold weather to the plains along the edge of the desert, sometimes going even as far as the Indus. It feeds on grain and insects, and frequents the cultivated districts at other than in the breeding season. Jerdon has an excellent description of its habits, &c. Breeds from July to September, laying from one to two eggs in a depression in the ground behind tufts of grass or small bushes, lined very sparingly with thin grass.

Gen. **Houbara**.—*Bonap.*

Legs shorter than *Eupodotis*; bill rather lengthened and depressed at the base; males ruffed; no hind toe.

Houbara macqueenii, *Gray, Ill. Ind. Zool.* pl. 47; *Gould. B. As.* pl. 8; *Jerdon, B. Ind.* iii. p. 612; *Murray, Hdbk., Zool., &c., Sind,* p. 204. (*Tilloor*, Sind.)—The Houbara Bustard.

Male.—Head crested; forehead minutely speckled with greyish brown and white; crown with a crest of elongate feathers, which are white at the base and tipped black; the feathers behind the crest resting immediately on the crown entirely white; head behind, ear-coverts and neck pencilled with pale brown and white; a patch of downy feathers at the base of the neck in mounted specimens, not seen in those freshly killed. The ruff begins immediately behind the ear-coverts with elongated feathers, one-half of which are white at the base for more than one-half their length, and the rest shining black; the

lower half of the ruff entirely white, the upper half edged behind and in front with black, rather lax feathers; back and scapulars buff or rufous buff, delicately pencilled with dark brown, each feather with two dark bands, the hinder band only being visible externally; upper tail-coverts with 3—4 narrow dark bands, which are distant from each other about an inch; tail brighter rufous or buff, with the same pencillings, the feathers with three bluish ashy bands, and the tips white; under tail-coverts white, some of the feathers with transverse bands and brownish mottlings; chin, throat and cheeks white, the feathers of the latter with dark tips; feathers of the lower neck and breast grizzled with pencillings, the elongated feathers on the breast pale bluish white, with dark shafts; rest of the lower surface white, also the axillaries and wing lining; primaries white at their base, and black for the terminal half, except the 1st primary, which in some specimens are dark brown on the outer web; lesser wing-coverts whitish with very fine vermiculations; winglet black; bill horny brown; irides bright yellow; legs greenish yellow.

Length.—25—32 inches, wing 14—15, tail 8·5 to 10. In non-breeding plumage the male has no crest nor the elongated black and white feathers, but the dark lax feathers are well developed in their place.

Hab.—Sind, Persia, Beloochistan and Afghanistan, Punjab, N. W. and Central Provinces, Rajputana, Kutch and Guzerat, also Kattiawar.

In Sind, this fine bird is extremely common during winter, affecting chiefly the large plains and hill sides covered with grewia bushes, on the fruits of which they principally live. It is usually found in parties of 2, 4, or 6 and, as game, is much sought for by all sportsmen. It is also largely hawked by the Sindees, *Falco sacer, Juggur and Peregrinus* being used for the purpose. It is found all over the plains of the Punjab, also in Beloochistan, Southern Persia and Afghanistan; breeding in Persia and Afghanistan, where it occurs in the summer. In Rajputana too it has been found, also in Kutch, Northern Guzerat and Kattiawar. The following, extracted from the "Field" entitled "Oobara shooting in Lower Sind" I think by "an old Sindee," gives a fair account of the mode of shooting this Bustard; he says—"So far as my experience goes, the Oobara, which may be briefly described as a bird of the Bustard tribe, is chiefly to be found in Sind. I have occasionally come across a solitary one or two in Rajputana and Guzerat, and I also presume they are to be met with in many parts of the Punjab, and, in fact, perhaps anywhere where large sandy plains exist. They are, I believe, seldom, if ever, to be found in black soil.

"The Oobara is a migratory bird, coming in with the cold weather, and disappearing at the first approach of the hot season. They are usually to be found in pairs, and feed early in the mornings and late in the evenings. At these times they are so wary, as seldom to be got at, even by careful stalking. They appear, however, to be peculiarly susceptible to heat, as the moment the sun attains any power they retire into the shade of a bush and, if undisturbed, lie quiet throughout the heat of the day, or if flushed, only take short flights. This is the

time to get them, and the usual method is by stalking them on a well-trained camel, driven by an experienced shikaree. The camel is made to circle round and round the bird, and the moment the bird perceives this it crouches down, trusting to its colour, which is exactly that of the ground, and to being so exactly similar when in this position to the several stones lying around it, to escape observation. The circle gradually becomes smaller and smaller, until the bird is brought within range. Most men shoot it on the ground, but as a rule I have found it better sport and easier to let the bird rise before firing, and then dropping it on the wing. The bird, fancying that (like an ostrich) when its head is hidden its whole body is out of sight, seldom, if ever, moves unless the camel stops in its circling, and even then its flight is so slow, as to make it almost impossible even for an ordinary shot to miss.

"As a game bird, the Oobara is perhaps one of the greatest delicacies that can be put upon the table, while its feathers are invaluable to the fisherman for salmon flies; and there is a little tuft of feathers just under the point of the shoulder which is greatly prized by the fair sex as an ornament for hats.

"All about Kurrachee is a very favourite country for Oobara, but, as may be imagined, anywhere within a radius of eight or ten miles they do not get much rest, and, in order to make a really good bag, it is now necessary to go beyond that distance. The nearest good spot I know of, where a day's sport can be had without finding another man stalking over the same plain, is about twenty-five miles by rail." At Mayting and Jempeer stations, on the S. P. and D. line, this Bustard is numerous, and it is not uncommon to see a bag from these places of from 10 to 12 a day.

Gen. Sypheotides.

Bill broad at base and ridged above; nostrils elongate; more than half of tibia bare.

Sypheotides auritus. *Lath.; Jard. and Selby, Ill. Orn.* pl. 49, 92; *P. C.* 533; *Jerd. B. Ind.* iii. p. 619, No. 839; *Murray, Hdbk., Zool., &c., Sind*, p. 207; *Str. F.* vol. iv. p. 10. (*Likh*, Sind.)—The Lesser Florikin.

Male.—Head, neck, breast, ear tufts and entire lower parts, black, paler on the vent and under tail-coverts; chin white, a few of the elongated feathers under the chin white mesially; lower part of hind neck and large wing patch white; back, scapulars and upper tail-coverts fulvous, mottled with buff and dark brown; tail brighter buff, with mottlings and three distinct bands, the last, subterminal; first three or four primaries dark or dusky brown, the rest broadly barred with rufous or bright buff, the long narrow tips mottled; ear tufts three on each side, the shafts of the feathers bare for nearly three-fourths their length from their base.

The *Female* is pure buff throughout, clouded and barred with deep

brown; lower part of the body almost white; chin and throat white; bill pale yellow, the ridge and tip dusky brown; irides yellow.

Length.—17 to 19 inches, wing 7 to 7·8, tail 4 to 4·5. *Female* slightly larger.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Central India, Kutch, Kattiawar, Rajputana, Concan and the Deccan. In Sind it occurs only in the vicinity of Kurrachee during August and September, chiefly at Mulleer, affecting the high grass. It breeds in the Deccan. In Sind a single egg was found on the Hubb plains by Mr. F. C. Constable.

Family, CURSORIDÆ,—Courier Plovers.

Tarsi long, slender; bill slender, arched beyond the nostrils, which are in a short triangular groove; wings long and pointed; toes three; no hind toe.

Cursorius coromandelicus, *Gmel.*; *P. E.* 892; *Gould. B. As.* pl. 37; *Jerdon, B. Ind.* iii. p. 626; *Murray, Hdbk., Zool., &c., Sind*, p. 207.—The Indian Courier Plover.

Forehead and top of head bright chestnut, a small patch of black on the nape; supercilium white, extending and meeting behind the nape; a black streak from the base of the nostril and through the eye, also extending and meeting behind; chin and throat white or pale buffy white; neck all round pale ferruginous, darkening into deep ferruginous on the breast and upper abdomen; a dark patch in the middle of the abdomen; primaries and their coverts black; under tail-coverts white; back, scapulars and wing-coverts earthy brown; upper tail-coverts the same; tail with the outer feathers on each side white, with a black edge subterminally on the inner web; rest, except the middle tail feathers, ashy brown at base, with a subterminal dark band and a white tip; bill black; irides brown; legs creamy white.

Length.—9—10 inches, wings 6, tail 2·37, tarsus 2·25.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Beloochistan, N. Guzerat, Rajputana, Kutch, Kattiawar, Concan and Deccan, affecting open grassy plains. Breeds in Sind from April to July.

Cursorius gallicus, *Gm.*; *Naum. vogt.* t. 171; *Gould. B. Eur.* pl. 266; *Jerd. B. Ind. App.* vol. iii. p. 874; *Murray, Hdbk., Zool., &c., Sind*, p. 207.—The Cream-coloured Courser.

Forehead and crown rufescent or pale orange buff, shading on to the back of head into grey or ashy grey, below which, on the nape, is a small black patch; supercilium extending to and meeting behind the nape, also a black streak from behind the eye; lores pale white; chin and throat pale white; breast isabelline brown, fading on the abdomen to albescent, and white on the under tail-coverts; back, scapulars, tertials and wing-coverts warm rufous buff, brighter on the tail, the outer feathers of which on each side have a subterminal black band on the inner web only; the others on both webs, and all, except the central tail feathers, broadly tipped white; primaries black; secondaries with their outer

webs concolorous with the back, the inner web, and subterminally on both webs also black, the edges of the tips white.

Length.—10·5 to 11 inches, wing 6·5 to 7, bill black, 1·06 in length in front, irides brown.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Beloochistan, Persia, Afghanistan, Kutch, Guzerat and Rajputana. Breeds in Sind from May to July. Extremely common on bare or open grassy plains.

Family, GLAREOLIDÆ,—Swallow Plovers.

Bill short, convex, broad at the base, compressed to tip; wings long, first quill longest; tail even or forked; tarsi short, reticulated; three toes in front, one behind very small; gape large.

Gen. **Glareola.**

Tail short and even, or long and forked; other characters as in the Family.

Glareola orientalis, *Leach. Lin. Tr.* xiii. 132; *Gould. B. Aust.* vi. pl. 23; *Schiel. Handlist Dierk.* t. 7, 79; *Jerdon, B. Ind.* iii. p. 631; *Str. F.* ii. p. 284, 465; viii. p. 371; *Murray, Hdbk., Zool., &c., Sind,* p. 208.—The Large Swallow Plover.

Forehead, crown, back of head, sides of neck, ear-coverts, back, scapulars and wing-coverts hair brown; upper tail-coverts white; tail forked, basally white, the feathers broadly tipped with dark brown; chin and throat rufescent, a few of the feathers in some specimens tipped dark brown; a dark line from each side of the mandible to below the neck, enclosing the rufous chin, throat and breast; upper abdomen and flanks earthy brown, with a tinge of rufescent; lower abdomen, vent and under tail-coverts white; axillaries and under wing-coverts behind, chestnut; primaries dark brown, almost black; the shaft of the first primary white; a few of the upper secondaries tipped white; irides dark brown; bill black; gape reddish; legs and feet dusky brown.

Length.—10 to 10·5 inches, wing 7·5, tail 4·25 to 4·5.

Hab.—Sind, Bengal and the Deccan; affects fields, and open or cultivated land in small flocks. It has, like others of the genus, a very rapid and swallow-like flight. Breeds in Sind. Mr. S. Doig in an article in *Stray Feathers*, vol. viii. p. 375, gives an account of its nidification in company with *Glareola pratincola*. "The breeding ground," he says, "was about 15 acres in extent, and was a salt plain with patches of coarse sedge here and there on it, the whole being surrounded by dense tamarisk and rush jungle, and was situated about half a mile from the bank of the 'Narra.' The nests were slight hollows scraped in the ground, and the greatest number of eggs in any nest was three, which seemed to be the normal number, but some contained only two eggs, of a light dirty green or drab colour, covered all over with dark purple blotches, dense at the broader end, and forming a zone. In shape they are from broad ovals to nearly spherical, and vary in size from 1·1 to 1·35 in length, and from ·80 to 1·05 in width."

The distribution of the *Glareolidæ* in India is not perfectly known.

Glareola Pratincola.

Glareola pratincola, *Linn. Syst. Nat.* i. 345, *P. E.* 882; *Naum. vogt.* t. 234; *Gould. B. E.* pl. 265; *Leach.*; *Linn. Trans.* xiii. pl. 12, 1,2; *Str. F.* vol. viii. p. 371; *Murray, Hdbk., Zool., &c., Sind,* p. 207. Glareola torquata, *Meyer,* ii. 404.—THE COLLARED PRATINCOLA.

Head, nape, back, scapulars and wing-coverts greyish brown; throat and front of the neck white, slightly tinged ferruginous, encircled by a narrow black band from the base of the bill; lores black; breast whitish brown; under wing-coverts chestnut; lower surface of the body white, tinged with reddish; upper and under tail-coverts white; tail forked, basally white, tipped with dark brown; bill black, red at the gape; irides red brown.

Length.—9 inches, wing 6·75 to 7.

Hab.—Sind, Arabia, Persia, Afghanistan and the Deccan. Breeds in Sind; eggs similar to those of *G. orientalis.*

Glareola lactea, *Tem. P. C.* 399; *Jerd. B. Ind.* iii. p. 632; *Str. F.* iii. p. 179; *Murray, Hdbk., Zool., &c., Sind,* p. 208.—THE SMALL SWALLOW PLOVER.

Forehead, crown, back, scapulars and wing-coverts pale earthy or grey brown, orbital feathers white; chin, throat and breast much paler than the back; lower abdomen, vent and under tail-coverts white; tail basally white, the central feathers broadly dark brown subterminally and tipped with white; the lateral or outer ones on each side narrowly tipped with dark brown, and edged with white; upper tail-coverts white; primaries dark brown, the first 3—4 distinctly white shafted and basally whitish on their inner webs; secondaries white, broadly edged on their outer webs and at the tip with brown; primary coverts dark brown, also the under wing-coverts; bill black; gape reddish; irides deep brown.

Length.—6·5 to 6·75 inches, wing 5·5 to 5·75, tail 2 to 2·06, bill at front 0·37, at gape 0·56.

Hab.—Sind, Punjab, N. W. Provinces and the Deccan, affecting the same situations as the last.

Sub-Family, CHARADRINÆ.—Plovers.

Bill slender, straight, flattened at the base, compressed and grooved; wings long and pointed; tarsi moderate, 1st quill usually longest; hind toe small or wanting.

Squatarola.—*Cuv.*

Nasal groove short; bill bulged at the tip; a very minute clawed hind toe present.

Squatarola helvetica, *Gmel.*; *P. E.* 853, 854; *Gould. B. Eur.* pl. 384; *Jerd. B. Ind.* iii. p. 635; *Str. F.* ii. 338; *Murray, Hdbk., Zool., &c., Sind*, p. 208. (*Burra* or *Wuddha Buttahn*, Sind.)—The Grey Plover.

Winter Plumage.—Forehead, lores, supercilia, chin, abdomen and entire lower surface, including the under tail-coverts, white; foreneck, sides of the breast and flanks white, the feathers with sub triangular or sub-quadrate brownish markings; feathers below the wing from the axilla long and black; head dusky brown, the feathers with narrow tips; rest of the upper plumage dusky brown, the feathers edged and tipped with white or greyish white; tail basally white, with a slightly rufescent tinge terminally, and with 6—7 transverse brown bands or bars. In summer the entire lower surface from the chin, except the vent and under tail-coverts, is black, also the lores and sides of the neck; forehead, supercilia and sides of the breast white; back and rump, scapulars and wing-coverts black, broadly tipped with brown and white; top of head and nape grey brown, the feathers tipped with white; tail white, banded dark brown; primaries dark brown, their inner webs white.

Length.—11 to 12 inches, wing 8, tail 3·25, bill at front 1·25, bill black, irides dusky, feet dark brown, or dusky brown, weight 7·5 oz.

Hab.—Sind, Beloochistan coast, Kutch, Kattiawar, and nearly all over the Indian coast. Occurs in flocks along the Sind sea coast during winter, especially on the mud flats. In the Kurrachee harbour it is numerous on the large island-like flats, especially about Baba Island, associated with the larger and smaller Kentish Plovers.

Gen. Charadrius.

Bill short and strong; first quill longest; hind toe wanting.

Charadrius longipes, *Tem. Fauna. Jap.* t. 62; *Gould. B. As.* vi. pl. 13.; *Jerd. B. Ind.* iii. p. 636. Charadrius fulvus, *Gm.*; *Str. F.* i. 228; ii. 287; vii. 482.—The Indian Golden Plover.

Winter Plumage.—Head dark brown, the tips of the feathers yellow; forehead white or yellowish white, as are also the lores, supercilia, chin, foreneck and the under tail-coverts; back, scapulars, rump, upper tail-coverts and wing-coverts dusky brown, the edges of the feathers with triangular or sub-triangular yellow spots; tail lighter in colour, the feathers also similarly edged with yellow spots; the neck behind, on the sides, and in front buffy, with a dusky tinge and yellow edgings and spots to the feathers; flanks pale brown, spotted with

soiled white. In the summer plumage, the upper plumage is much darker, nearly black, the yellow spots less numerous and smaller, the forehead is white, and the cheeks, throat, neck, and entire under parts are black; primaries black, the shafts of the first three white; secondaries tipped with white, also the median wing-coverts; tail brownish with transverse band of black.

Length.—10 to 10·5 inches, wing 6·75, tail 2·75, bill at front 0·87, tarsus 1·75, bill dusky at base, black at the tip, irides deep brown.

Hab.—Sind, Punjab, Kutch, Kattiawar, Deccan, and India generally, in open plains or in the vicinity of rivers and ploughed fields.

Charadrius pluvialis, *Linn.*—The European Golden Plover.

Winter Plumage.—Forehead yellowish white, streaked and spotted with pale brown and grey; head on the sides greyish brown; the crown, back of neck and nape greyish brown with purple reflections and yellow angular spots on the edges and tips of the feathers; chin and throat whitish; breast dusky greyish white, tinged yellow, and spotted with darker grey; axillary plumes white; greater and lesser wing-coverts greyish black, the spots paler and the feathers of the greater coverts tipped with white; the tail is deep brown, and barred obliquely with yellowish or yellowish white; upper tail-coverts like the back. In summer it undergoes the same change as *longipes*, but the yellow becomes brighter, and the lower parts intense black, except the sides of the neck, breast and body, which are yellowish white, with dark and dusky patches or marblings; primaries and secondaries dusky brown, the shafts of the first five white anteriorly.

Length.—10·5 to 11·5 inches, wing 7·5, bill black, irides deep brown.

Hab.—Sind, Punjab, and Beloochistan.

This species was first entered in the Sind list by Mr. Hume with a query. Since then all the specimens obtained by myself and others were *longipes*. In my *Hand Book* mention was made that *pluvialis* would be found to occur, Mr. Blanford having recorded it from only 200 miles further west at Gwadur. Mr. Brooks, *Stray Feathers*, viii. 489, records it now from near Sehwan. Mr. Hume, in vol. i. p. 229 of *Stray Feathers*, points out the difference between *fulvus* or *longipes* and *virginicus* from America. He says, "*pluvialis* is at once distinguished by its pure white axillary plumes, which in *fulvus* are brownish or smoke grey. *Fulvus* and *virginicus* differ chiefly in their relative proportions, the former being always smaller." The following are the dimensions of the three given by Harting:—

	Bill.	Wing.	Tarsus.
C. Virginicus	1·	7 to 7·4	1·6
C. Fulvus	0·8 to 0·9	6·4 to 6·6	1·5
C. Pluvialis	0·9	7·5.	1·4

Gen. **Ægialitis.**—*Boie.*

Bill slender, grooved on upper mandible for two-thirds its length; front of bill raised; upper mandible slightly the longer; 1st quill longest.

Ægialitis geoffroyi, *Wag. Ibis.* 1870, pl. 11; *Jerd. B. Ind.* iii. 638; *Str. F.* i. 229; ii. 288; *Murray, Hdbk., Zool., &c., Sind*, p. 209.—THE LARGE SAND PLOVER.

In winter plumage, head, neck, nape, back, sides of the breast, scapulars and wing-coverts greyish brown; a streak from the base of the mandible under the eye to the ear-coverts slightly darker; forehead, a streak above the eye, chin, throat, sides of the neck and rest of the lower parts white; upper tail-coverts dull white or pale grey brown; primaries and their coverts dark brown; outer web near the tips and the tips of the secondaries white; longest tertial reach to between the 3rd and 4th primaries. In summer plumage, the forehead, lores, ear-coverts and beneath the eye are black; on each side of the forehead is a white spot; the neck and breast rufous; the throat and chin white; head tinged with rufescent, and the upper parts margined with the same; the shafts of the feathers of the back, scapulars and wing-coverts in both stages are dark; primaries dark brown; the outer webs of the inner ones white, also the tips of the secondaries.

Length.—8 to 9·25 inches, expanse 17 to 19 inches, wing 5·4 to 5·93, tail 2, bill at front 1, tarsus 1·5, legs greenish, bill black, irides brown.

Hab.—Sind, Beloochistan Coast, Persian Gulf, Bengal, Rajputana, Kutch, Kattiawar and India generally during winter. Extremely common along the sea coast and at the mouths of the Indus in large flocks.

Ægialitis pyrrhothorax, *Tem.; Gould. B. E.* pl. 299; *Jerd. B. Ind.* iii. p. 639, No. 847; *Str. F.* i. 230; ii. 289; *Murray, Hdbk., Zool., &c., Sind*, p. 209. *Æ.* mongola, *Pall.*—THE LESSER SAND PLOVER.

In both winter and summer plumage similar to *Æ. geoffroyi*, but smaller in all measurements.

Length.—7 to 7·25 inches, expanse 15 inches, wing 5 inches, tail 1·87, bill at front 0·75, tarsus 1·25. The tertials reach to between the first and second primaries; bill black, irides brown, legs dusky plumbeous.

Hab.—Sind, Beloochistan Coast, Persian Gulf, Afghanistan, and India generally, along the sea shore and banks of rivers, not far inland.

Ægialitis cantiana, *Lath.; Gould. B. Eur.* pl. 298; *Jerd. B. Ind.* iii. p. 640, No. 848; *Str. F.* i. 220; *Murray, Hdbk., Zool., &c., Sind*, p. 210.—THE KENTISH DOTTEREL.

Male in Winter Plumage.—Forehead, streak over the eye, extending to the ear-coverts, chin, throat, ring round the neck, breast, abdomen and under tail-coverts white; outer tail feathers on each side also white, with a subterminal dusky spot on the inner web: crown, nape, neck behind, a streak from the base of the bill under the eye, cheeks, back, scapulars, sides of breast and tertials earthy or greyish brown, the feathers with darker shafts; in some (February specimens) the feathers are tinged with rufous, and those on the fore-

part of the crown, very slightly (absent in most) white tipped; tail earthy or grey brown, darker subterminally, and all, except the central feathers, tipped pale fulvous or white; primaries dusky brown, 4th, 5th and 6th with a patch of white on their outer webs; secondaries edged and tipped terminally with white; edge of the wing and under wing-coverts white.

In nuptial plumage, the white of the forehead extends broadly over the eye and beyond it, behind which on the forecrown is a patch of black followed by a reddish or reddish brown patch, tinged with grey. The streak from the base of the bill through the eye to the ear-coverts is black, and there is a large patch of black on each side of the breast; back, scapulars and tertials greyish brown; the 1st primary is the longest; primaries dusky brown; wing-coverts grey brown, the greater series tipped with white; secondaries white at their base and tips; under wing-coverts, chin, throat and under parts white; the tail is like the back, the middle feathers longest and dusky brown near the tip, the outer ones on each side white.

Length.—6·75 inches, wing 4·3, tail 2, bill at front ·75; bill black, irides brown, feet dusky greenish.

Hab.—Beloochistan, Persia, Afghanistan, Punjab, N. W. Provinces, Bengal, Rajputana, Kutch, Guzerat and South India.

Ægialitis phillipinus, *Lath.*; *Sonn. Voy.* t. 46; *Jerdon, B. Ind.* iii. p. 640, No. 849; *Murray, Hdbk., Zool., &c., Sind*, p. 209.—The Indian Ringed Plover.

A narrow streak above the base of the bill continued behind, under, and through the eye to the ear-coverts, black; crown of head and ring round the neck black; a patch of white on the forehead above the black frontal streak; chin, throat, and under parts from below the black collar, including the under tail-coverts, white; nape and upper plumage cinereous or greyish brown; primaries dusky brown; tail with the middle feathers paler than the lateral ones, except the outermost on each side, which are white, with a dusky spot on the inner web; under wing-coverts white.

Length.—7 to 7·25 inches, wing 4·5, tail 2·5, bill at front 0·56; bill black, irides brown, legs yellowish.

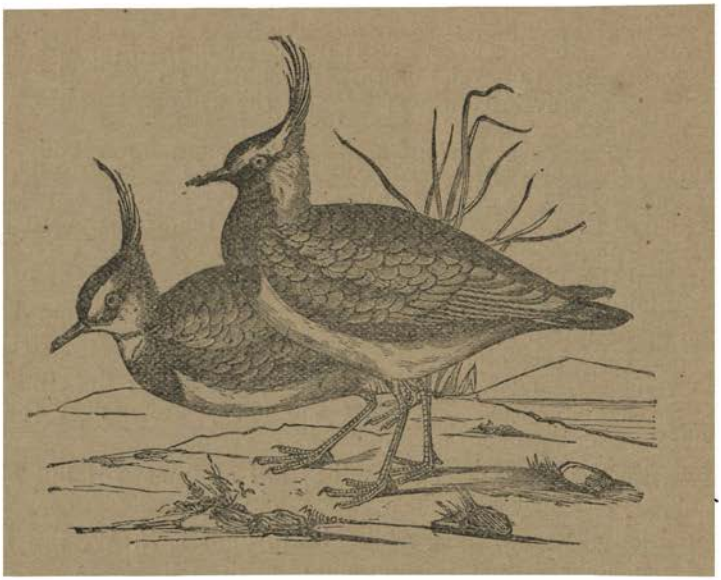
Hab.—Sind, Beloochistan, Persia, Afghanistan, E. Turkistan, Nepaul, Cashmere and throughout India. Extremely common in rice fields and along the banks of the Indus.

Sub-Family, VANELLINÆ.—Lapwings.

Bill rather compressed, straight, convex at the tip; nostril in a long lateral groove; wings pointed and long; tail broad; hind toe short.

Gen. **Vanellus**.—*Linn.*

Bill straight; 2nd and 3rd quills longest; shoulder of wing with a small (not prominent) tubercle.



Vanellus cristatus, *Meyer ; P. E.* 242 ; *Gould. B. Eur.* pl. 291 ; *Jerd. B. Ind.* iii. p. 643, No. 851 ; *Str. F.* i. 231 ; *Murray, Hdbk., Zool., &c., Sind.*, p. 210.—The Crested Lapwing or Peewit.

Entire head, crest, chin, a line below the eye, breast and foreneck black, glossed with greenish ; lores, supercilia and behind the eye, also sides and back of the neck, and from the termination of the black breast to the belly, white ; the sides of the head in some immature specimens speckled with brown or dusky ; upper tail-coverts pale reddish chestnut ; under tail-coverts slightly paler ; back and scapulars olive green, glossed with coppery and purple ; golden green on the lower back and rump ; primaries black, the first three broadly terminated with greyish white ; 1st quill shortest, third longer than the second or nearly equal ; greater and lesser wing-coverts like the back ; tail white basally, and broadly black terminally, with narrow white tips to all the feathers ; the outermost feather entirely white, except a dusky spot subterminally on the inner web.

Length.—12 inches, wing 9, tail 4, tarsus 2 ; bill black, irides hazel brown, legs orange brown. In winter plumage the chin and throat are white, and there is much brown specklings on the sides of the face and nape. The female is like the male in winter plumage, and throughout of a duller tint.

Hab.—Sind, Punjab, N. W. Provinces, Beloochistan, Persia, Afghanistan and E. Turkistan, also Nepaul and Cashmere. It is said to breed in the Punjab. In Sind it is a winter visitant, and is found in open places, marshy ground, and the banks of canals.

Gen. **Chettusia**.—*Bp.*

Head not crested; plumage ashy; otherwise as in *Vanellus*.

Chettusia gregaria, *Pallas, Zoogr.* ii. t. 56; *Gould. B. Eur.* pl. 292; *Jerd. Birds Ind.* iii. p. 644, No. 852; *Str. F.* i. 231; iv. 13; *Murray, Hdbk., Zool., &c., Sind*, p. 210.—The Black-sided Lapwing.

Forehead, superciliary extending to the occiput, lower belly, vent and under tail-coverts white; top of head, a narrow band from the base of the bill through the eye, and the middle of the abdomen black; back of neck, back, and scapulars olivaceous brown, tinged greyish; sides of head and neck pale rufous, passing to greyish or brownish on the breast; primaries black; secondaries white; tail and upper tail-coverts white, with a broad subterminal black band, tipped with white; outermost feathers white.

Length.—12·5 to 13 inches, wing 8·5, tail 3·5, tarsus 2·3, bill at front 1·2. In the young the black abdominal patch is wanting. The females are much duller than the males in colour.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, Kutch, Kattiawar, Rajputana and Central India.

Chettusia leucura, *Licht.; Eversm. Reise.* p. 137; *Jerd. B. Ind.* iii. p. 646, No. 853. Chettusia flavipes, *Savigny, desc. de'l Egypt. Zool.* p. 6, f. 2.—The White-tailed Lapwing.

Head and neck brown, very pale, almost fulvous on the forehead; a small whitish patch behind the eye; chin and throat white; back and scapulars brown, glossed with reddish purple; upper tail-coverts and tail white; breast pale greyish brown, bluish ashy on the lower part; lower abdomen and under tail-coverts white, the former tinged of a roseate hue; primaries black; secondaries white, broadly tipped on their outer webs with black; median and greater wing-coverts basally ashy, broadly edged subterminally on the outer web with black and tipped with white.

Length.—11 to 11·5 inches, wing 7, tail 2·75, bill at front 1; bill black, irides brown red, legs bright yellow.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Beloochistan, Afghanistan, Persia, Kutch, Kattiawar, and North Guzerat, also in Central India, and probably the Deccan; common in the vicinity of jheels, tanks, &c.

Gen. **Lobivanellus**.—*Strickl.*

A lappet of skin in front of the eye extending to the base of the bill; hind toe very small.

Lobivanellus indicus, *Bodd.; P. E.* 807; *Gould. C. B. E.* pl. 78; *Str. F.* iii. 648; vii. 67. Lobivanellus goensis, *Jerd.* iii. p. 648, No. 855; *Murray, Hdbk., Zool., &c., Sind*, p. 211.—The Red-wattled Lapwing or "Did he do it."

Head, nape, back of neck, chin, throat, neck in front and breast black; a broad streak from behind the eye along the sides of the neck, abdomen and upper and lower tail-coverts white; tail white with a sub-

terminal dark band, and broadly tipped white; back, scapulars and tertials pale brown; primaries and their coverts black; greater wing-coverts like the back basally, and broadly edged and tipped with white, forming a conspicuous wing band.

Length.—12·5 to 13 inches, wing 9·5, tail 4·75, bill at front 1·27, wattles red.

Hab.—Throughout India, Beloochistan, Persia, and Afghanistan. In Sind it is every where common, during both winter and summer, and breeds in the Province from April to July. It is an extremely noisy bird, and especially so during the breeding season. Its vulgar name "Did he do it" is very appropriately given, being its continuous cry, with "Pity to do it," the place resounding with its almost endless echoes, till the intruder is out of reach of its nest. The nest is usually a small depression in the earth, with or without lining of any kind, and made in the vicinity of a marsh. The eggs are generally of a deep green colour, irregularly marked with blotches and streaks of a brownish black.

Gen. **Sarciophorus**.—*Strickl.*

Wattles yellow; bill rather slender; hind toe absent.

Sarciophorus bilobus, *Gmel.; P. E.* 880; *Jerd. B. Ind.* iii. p. 649, No. 856. Lobipluvia malabaricus, *Bodd.; Murray, Hdbk., Zool., &c.*, p. 211.—The Yellow-wattled Lapwing.

Breeding Plumage.—Head and nape black; ear-coverts white, extending behind the nape; chin and throat black; neck in front and behind, also the back, scapulars and tertiaries pale brown; breast slightly darker, edged with dark brown; rest of the under surface including the upper and lower tail-coverts white; tail white, with a black band subterminally and a white tip, except three of the lateral tail feathers, which are white, with a subterminal dusky spot on the outer web of the third feather; primaries and their coverts black; the inner webs of the primaries white, decreasing in extent to the inner ones; secondaries basally white, and terminated with black; greater wing-coverts like the back, but broadly tipped and edged with white, forming a conspicuous white wing band.

Length.—11 to 11·75 inches, wing 8·25, tail 3·25, bill at front 1; irides brown, bill yellow at the base, the rest black; wattles yellow.

Hab.—Nearly throughout India and Ceylon. In Sind it is a resident, frequenting dry stony or grassy plains usually in company with *Cursorius isabellinus* or *gallicus*. Breeds in August on the edges of cultivated land. The eggs are not unlike those of *L. indicus*, but are smaller, and have a stone colour ground, with deep brown and nearly black blotches. In the winter plumage, the chin and throat and the black edges to the feathers of the breast below are wanting, and the upper plumage is duller or paler brown.

Hoplopterus.—*Bp.*

Shoulder of wing with a stout spur. No hind toe in the Indian species.

Hoplopterus ventralis, *Cuv.; Gray, Ill. Ind. Zool.* pl. 63; *Jerd. B. Ind.* iii. p. 650, No. 857; *Str. F.* vol. iii. 181; vi. 457; *Murray, Hdbk., Zool., &c., Sind*, p. 211.—THE SPUR-WINGED LAPWING.

Head, crest, lores, sides of the face, as far as the middle of the eye, chin, throat, and foreneck black; a white streak from behind the eye on each side meeting on the nape, bordering the black feathers of the hind crown and nape; cheeks white, the white extending on to the upper breast all round, enclosing the black of the foreneck and forming a pectoral patch; breast below, back, scapulars and tertials pale brown; shoulder of the wing black; primaries black; secondaries basally white, tipped and edged with black, the black decreasing in extent on the hinder feathers; greater wing-coverts white, forming a conspicuous wing band; upper and under tail-coverts and entire under surface white, except a patch on the middle of the abdomen; tail white, broadly terminated with black.

Length.—12 inches, wing 7·75 to 8, tail 4 to 4·2, bill at front 1·11; bill black, irides deep brown, legs blackish, tinged with reddish.

Hab.—Northern India generally, Punjab, N. W. Provinces, Oudh, Bengal, and Central India, along the sandy banks of rivers; also in Pegu and Nepaul. It is rare in Sind. A single specimen was got by Mr. W. Wallinger on the banks of the Indus near Buggatora, who also mentions having seen it on the Aral near Sehwan.

Sub-Family, ESACINÆ,—STONE PLOVERS.

Bill strong and thick; no hind toe; nostrils linear, in a groove near the base of the bill; gonys strongly angulated.

Gen. Æsacus.

Bill long, sub-curved, the lower edge of the under mandible wide in the middle, then curving to a point.

Æsacus recurvirostris, *Cuv.; G. R. Gray, M. G. B.* pl. 142; *Jerd. B. Ind.* iii. p. 652, No. 858; *Str. F.* vol. v. p. 121; *Murray, Hdbk., Zool., &c., Sind*, p. 211. (*Karwanak, Chota Taloor*, Sind).—THE LARGE STONE PLOVER.

Forehead and a broad line down the sides of the face white; a broad dark streak on each side from the base of the lower mandible; feathers round and behind the eye white, broadly bordered with dark brown; chin, throat, abdomen, and under tail-coverts white; top of head, neck behind, back, scapulars and tertials pale brown, the feathers distinctly dark-shafted; neck in front white, in some specimens obtained in April greyish brown; the breast ashy, contrasting with the pure white of the rest of the under surface; primaries black, the first three quills with a patch of white on their terminal third, and the last three basally and at tip white, with a subterminal black band; lesser wing-coverts dark brown; median and greater coverts pale greyish brown, the latter white tipped; secondaries dark brown, their inner webs white; tail pale brown at base, with a subterminal white band and a

broad black tip, except the outermost feather, which is white at the base and more broadly tipped with black; bill black, greenish at the base; irides yellow; legs yellow.

Length.—20 inches, wing 10·5, tail 4·37, tarsus 3·5, bill at front 3, at gape 3·75.

Hab.—Nearly throughout India, along the sea coast and banks of large rivers. From the stomach of a specimen got in the Kurrachee harbour ten calling crabs (*Gelasimus annulipes*) were extracted.

Gen. **Œdicnemus.**—*Cuv.*

Bill longer than the head, straight and slightly depressed at the base; culmen raised near the point; mandible angulated beneath; nostrils in the middle of the bill in a longitudinal slit; toes three; tail graduated.

Œdicnemus crepitans, *Tem.*; *P. E.* 919; *Gould. B. E.* pl. 288; *Jerd. B. Ind.* iii. p. 654, No. 859; *Str. F.* i. 232; *Murray, Hdbk., Zool., &c., Sind*, p. 212. Œdicnemus scolopax, *S. G. Guel.*—The Stone Plover or Bastard Floriken.

Lores white, with a few brown spots; chin and throat white; a distinct narrow moustachial stripe from the base of the lower mandible; head, neck, back, scapulars and upper tail-coverts reddish ashy, each feather with a mesial dusky streak; breast the same as the back; belly white; under tail-coverts reddish ashy; tail white basally, all the feathers except the middle ones tipped with black; thigh-coverts white; primaries black, the first three quills with a patch of white at their terminal third, and the last three white basally and at tip with a subterminal dark band; edges of the greater wing-coverts white, forming a wing band.

Length.—16 inches, wing 9, tail 4·5, bill at front 1·5, irides and orbits yellow, also the legs and feet.

Hab.—Throughout India, also Persia. Affects stony places and the sides of sloping banks; runs very swiftly, especially when first surprised, stops short now and again after the manner of *Cursorius isabellinus*, and squats close to the ground, depending for safety on the colour of its plumage, which is like that of the ground. Its flight is strong and steady, but it seldom uses its wings, except when hard pressed; usually turns out in the evening in quest of food, which consists chiefly of worms. The young are said to run from the nest within three hours of their birth. It is not uncommon to meet with parties of this bird in looking for Oobara (*H. Macqueenii*) among Grewia bushes, and perhaps from this circumstance and its lineated plumage it is called the "*chota* or small Taloor." Breeds in the Province from April to June. It makes no nest, the eggs being laid in a small depression in the ground, usually sheltered by a stone.

Family, HÆMATOPODIDÆ, *Bp.*—Sea Plovers.

Feet with three toes, and a very small hind toe; bill long, strong, front half compressed, tip blunt; wings long and pointed.

Sub-Family, STREPSILINÆ.—*Bp.*

Characters those of the Family; bill slightly curved upwards.

Strepsilas interpres, *Linn.; P. E.* 856; *Naum. vogt.* t. 180; *Gould. B. Eur.* pl. 318; *Jerd. B. Ind.* iii. p. 656, No. 860; *Str. F.* i. 233; iv. 464; *Murray, Hdbk., Zool., &c., Sind*, p. 212.—The Turnstone.

In winter the Turnstone is clad in very sober plumage; the crown and hinder part of the head are dusky, edged very narrowly with greyish brown; the lores pale brown, or in some specimens greyish brown; the chin and throat are white, also a patch on each side of the neck, bordered in front along the sides of the white throat patch with dusky or dark brown; upper back, scapulars, rump, breast and sides of the breast dusky or dark brown, according to season, edged with rusty or brownish red; some of the scapulars partly edged with white; tertials long, reaching beyond the fifth quill, edged and tipped with rufous or red brown; lesser wing-coverts, like the upper back, white at the shoulder; the secondary or greater coverts tipped with white, forming a conspicuous wing bar; primaries and secondaries black, the inner webs of the former and tips of the latter white; back, lower surface of the body from below the breast, also the thigh and upper and lower tail-coverts white; a patch of black on the rump; tail feathers white, with a subterminal black band, except the central ones, which are entirely black. In the summer or breeding plumage, the forehead, a band over the eye, lores and a patch behind the eye are white; the crown of the head is also white, broadly streaked with black. There is also a black streak behind the white frontal patch, continued to the front and below the eye on each side joining the black streak

from the lower mandible, and getting lost on the neck, whence spring a black demicollar not extending on the upper surface of the neck, which, like the head, is white with dark streaks; back of neck white, extending down the sides between the black demicollar and sides of the breast; chin white; throat and breast deep black; upper back and scapulars black, the feathers broadly edged and tipped with red rust colour; some wholly so, especially the scapulars; lesser and median wing-coverts black, broadly edged and tipped with bright rust colour; the tips of the greater or secondary coverts white, forming a wing band; quills black; the inner webs, and part of the outer webs of the last two or three, basally white; secondaries like the quills, but broadly white on their inner webs, and also narrowly tipped white; tertials dark brown, edged and tipped with rusty; back, entire lower surface below the breast, and upper tail-coverts white; rump with a patch of black; tail as in the winter plumage; bill black; irides deep brown; legs orange yellow.

Length.—8 to 8·5 inches, wing 6, tail 2·5.

Hab.—India generally, along the sea shores, and sometimes inland along the banks of large rivers. Its geographical range is very wide, being found in Europe, America, and Africa, and throughout Asia, in suitable localities. In Sind it is extremely common in the Kurrachee harbour and at the mouths of the Indus. It occurs also on the Sambhur lake, and on the banks of the river at Poona, in the Deccan; also on the Beloochistan Coast and in the Persian Gulf.

Dromas, *Payk.*—Bill long, lower mandible strongly angulated; tarsus long; wings reach beyond the tip of the tail; feet webbed; hind toe long and slender.

Dromas ardeola, *Paykl. Handlist, Ac. Vet. Stockhlm.* t. 8; *Jard. and Selby, Ill. Orn.* pl. 157; *Jerd. B. Ind.* iii. p. 658; *Str. F.* ii. 293; vii. 186; viii. 383; *Murray, Hdbk., Zool., &c., Sind*, p. 212.—THE CRAB PLOVER.

Whole head, neck all round, chin, throat, breast, entire lower parts, back, upper and lower tail-coverts and upper tertials white; generally a dark loreal spot; mantle and interscapulars black; primaries and secondaries black, their inner webs white; greater wing-coverts black; tail reddish ashy, as also are some of the tertials near their tips; bill black, 2·5 inches in length; irides brown.

Length.—15 to 15·5 inches, wing 8·75 to 9, tail 2½.

Hab.—Indian coasts, Africa, Red Sea, Seychelles, Madagascar, Beloochistan Coast and the Persian Gulf. Common in Sind in the Kurrachee harbour. Breeds in the Persian Gulf near Bushire. Mr. Hume has given an account of its nidification in vols. vii. and viii. of *Str. Feathers*. There is no nest, and the eggs are laid in a burrow about 4 feet deep in the loose sand; but whether this is dug by the bird, or is that of a crab, is still a question, the holes being, it is said, too narrow to admit the bird.

Gen **Hæmatopus**.—*Linn.*

Bill straight, long, very slightly bent upwards; nostrils linear in a long cleft; toes three, all placed forward, no hind toe.

Hæmatopus ostralegus, *Lin.*; *Gould. B. Eur.* pl. 300; *Jerd. B. Ind.* iii. pp. 660, 661; *Str. F.* i. p. 234; *Murray, Hdbk., Zool., &c., Sind*, p. 212.—THE OYSTER-CATCHER.

Entire head, neck, breast, upper back, scapulars and tail black; lower orbital feathers white; lower back, and entire lower parts white, also a ring round the throat; primaries black, the inner webs and part of the outer webs of all, except the first two quills, white; the white on the outer webs of the innermost primaries spreading to the edges; secondaries basally and narrowly at tip white, with a subterminal black band; greater coverts and some of the secondaries and lower tertiaries white, forming a large wing patch; lesser and primary coverts black; bill orange yellow, or bright scarlet, 3·5 to 3·75 inches long; irides lake red; orbits orange.

Length.—16 to 17 inches, wing 10·5, tail 4, tarsus 2·25.

Hab.—Europe, Siberia, India, Ceylon, Afghanistan, Beloochistan, Persian Gulf, Sind, the Eastern and Western Coasts of India; in fact has a very wide distribution. Inhabitants of the sea shores, being seldom found inland. It lives chiefly on molluscs, worms, &c., and is said to easily disengage limpets from the rocks, and to pluck out the oysters from their half-opened shells, with its admirably adapted wedge-shaped bill. Oyster-Catchers feed in the mornings and evenings, and also at night, and are at all times watchful and shy in their habits.

Family, GRUIDÆ.

Bill long; mandibles equal; nostrils in a deep groove; wings long; tertials long; tail short, even; tarsi long, scutelated.

Grus.—Bill moderately long, straight, somewhat thick, slightly flattened at the base and curved to the tip; 3rd and 4th quills of wing longest; tail short; tarsi with transverse scales; hind toe very short.

Grus antigone, *Linn.*; *Edw. B.* pl. 45; *Jerd. B. Ind.* iii. p. 662; *Str. F.* vi. 458; *Murray, Hdbk., Zool., &c., Sind.*, p. 212.—THE SARUS CRANE.

Head and neck naked, covered behind with numerous crimson papillæ, and clad with a few black hairs, which accumulate below on the neck, and form a sort of mane down the nape of the neck; ear-coverts white; below this the neck is whitish grey, which gradually passes into a blue or French grey, which is the colour of the whole plumage; the quills and inner webs of the tail feathers being dusky slaty; seasonally it assumes a pure white collar immediately below the crimson papillose; skin of the neck, and some of the tertiaries and scapulars become white, lengthened, hang over gracefully and exceed the tail in length; bill pale sea green, brownish at the tip; irides orange red; legs and feet pale rosy red.

Length.—52 inches, wing 26, tail 9·25, bill at front 6·25, tarsi 12·5 to 13.—(*Jerdon*).

I have not a satisfactory specimen.

Hab.—Throughout the greater part of India. It is rare in Sind. In the Punjab it is found in the Delhi and other districts, also in Rajputana, Kutch, Concan and Deccan. Breeds over the whole of the N. W. Provinces, Upper Bengal, Oudh and Guzerat, also Central India and Khandeish.

Grus leucogeranus, *Pall. It.* t. i; *P. C.* 467; *Jerd. B. Ind.* iii. p. 663; *Str. F.* i. 235; vii. 437; *Murray, Hdbk., Zool., &c., Sind*, p. 213.—THE LARGE WHITE, SNOW-WREATH, or SIBERIAN CRANE.

Plumage wholly white; primaries black; tertiaries white, much lengthened and reaching to or beyond the end of the tail; nude parts of the face and legs red; hind head subcrested. In the young Mr. Hume (*Game Birds of India*) says "There is no bare space about the face, the whole head and upper half of the neck are of a somewhat rusty buff, which is deepest on the head and cheeks, and pale on the chin and throat."

Length, Male.—53 to 56 inches, wing 23 to 26, expanse 90 to 99·5, tarsi 11 to 12, bill from gape 7·75 to 8. *Females* are smaller, irides pale yellow, bill brown, nasal membrane red.

Hab.—A winter migrant to India; occurs in the N. W. Provinces, Punjab, and the Himalayas; also in Afghanistan, Eastern Turkistan and Siberia. Uncommon in Sind. I have never met with it. Mr. Hume has however seen and recorded it.

Grus cinerea.

Grus cinerea, *Bechst.*; *P. E.* 769; *Gould. B. Eur.* pl. 270; *Jerd. B. Ind.* iii. 865; *Str. F.* i. 235; iv. 15; *Murray, Hdbk., Zool., &c., Sind*, p. 213 (*Koonj*, Sind).—THE COMMON CRANE.

Forehead to the middle of the crown covered with black hairy down, through which the red skin shows; behind this nearly bare and entirely so for about two inches on the nape, which is ash grey; chin, throat and foreneck black; a broad white streak from behind the eye, extending along the back of the neck from below the nape and partly on the sides; lores and cheeks black; upper and lower surface of the body dark bluish ashy; greater wing-coverts dull black; secondaries and tertiaries grey and tipped with black, the latter in texture resembling the plumes of the ostrich, narrowing to a point, forming an elegant tuft of loose feathers, curled at the ends and falling gracefully over the tail; legs and bare part of the thighs black; bill greenish brown at the base, tinged blackish in the middle, with the tip dark horny; irides yellowish, orange red or reddish brown in some.

Length.—43 to 46 inches, wing about 24, tail 7, tarsus 8·75 to 9, bill 4·3 to 4·8.

Hab.—Europe, India, N. Africa. In India it is a winter visitant everywhere. Besides occurring in Sind, it is recorded from Rajputana, Kutch, Kattiawar, Deccan, N. Guzerat, Rajputana, Central India, Khandeish, Punjab, N. W. Provinces, Oudh and Bengal. It has also been found in Afghanistan, Beloochistan and Persia.

When feeding the Common Crane has always a sentinel posted to give the alarm of danger, and hence it is extremely difficult to get within gun-shot of the flock. The ordinary procedure is to walk alongside a bullock or horse, as if passing by them, and to fire immediately they rise; a duck gun with large shot usually brings down 2 or 4 out of a flock. In Sind and probably in other parts of India too, the food of this Crane consists of grain of all kinds; when in large parties they commit great havoc in wheat fields.

Gen. **Anthropoides.**—*Viell.*

Bill shorter than in *Grus*; head and neck feathered; breast feathers lanceolate and hackled; tarsi long.

Anthropoides virgo, *Linn.*; *P. E.* 241; *Edw. B.* pl. 134; *Jerd. B. Ind.* iii. p. 666; *Murray, Hdbk., Zool., &c., Sind.*—THE DEMOISELLE CRANE.

Forehead, lores, sides of the face, chin, throat, neck in front, and breast plumes deep black; ear tufts white, issuing from behind the eye; primaries black; secondaries grey, black tipped; back, scapulars, tertials, upper tail-coverts and entire lower surface pale blue grey; tertials elongated and drooping over the primaries and tail feathers, most of them with a broad black tip.

Length.—31 to 35 inches, wing 19 to 20 or more, tail 6 to 7·5, tarsus 7, bill from gape 2·7 to 3·05, tertiaries project about 6 inches beyond the primaries.

Hab.—Throughout the greater part of India; rare in Sind. Occurs in Rajputana, Kutch, Kattiawar, N. Guzerat, Deccan, the Nizam's dominions, where it is rare; also in Assam, N. W. and Central Provinces, Central India, Khandeish and Oudh. Occurs also in Afghanistan and Beloochistan, and probably also in Persia. In the Deccan, about the Sattara and Belgaum districts, as well as in the Concan and South India, it is said to be fairly common, arriving about December.

Tribe, LONGIROSTRES.—*Cuv.*

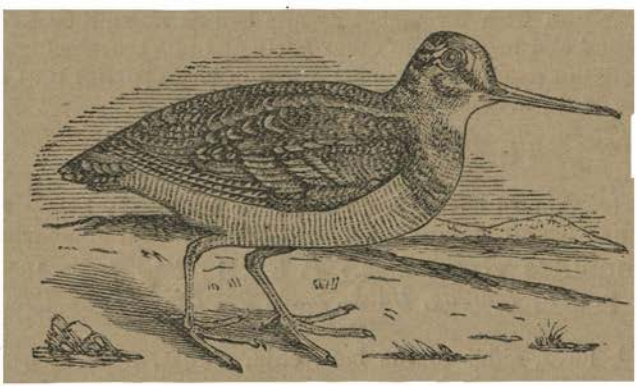
A family of wading birds, in which Cuvier includes the snipe, godwits, ibises, curlews, phalaropes, &c., at the end of which come the avocets. These are nearly all migratory birds, and associate in flocks during winter. The characters by which this tribe is chiefly distinguished are the long slender bill, and long and pointed wings; the hind toe is usually present, but wanting in some.

Family, SCOLOPACIDÆ.

Bill long, straight, compressed, soft, the point enlarged; the mandibles furrowed for half their length; upper mandible slightly longer than the lower; nostrils lateral, situated basally in a groove and covered by membrane; feet moderate, slender, three toed, not webbed; hind toe present; plumage varied and rich.

Gen. **Scolopax.**—*Linn.*

Characters same as those of the Family; lower mandible channelled only to the middle; wings long, 1st quill longest; tibia feathered to the knee.



Scolopax rusticola, *Linn.*; *P. E.* 885; *Gould. B. Eur.* pl. 319; *Jerd.* iii. 672; *Str. F.* vi. 459; *Murray, Hdbk., Zool., &c., Sind*, p. 213.—The Wood-Cock.

The peculiar shape of the head of this esteemed bird is almost a sufficient character to identify it among others. The head is more obtusely triangular than round; the eyes are placed above its middle, near the top, and the ears are nearly on a level with the corner of the mouth.

Crown of the head ashy, or ashy grey; the nape and back part of the head with four transverse alternate bands of black and rusty red or chestnut brown; a dark streak from the gape to the eye; the orbital feathers pale buff; back, scapulars, wing-coverts, and upper tail-coverts, marbled, spotted, barred, streaked and variegated with black, white, grey, red, brown, rufous and yellow, that it is not possible to describe them with accuracy; chin pale yellowish brown, or nearly white; throat and breast pale brown, barred transversely with dark brown; primaries blackish, with triangular spots of pale reddish brown on both webs; secondaries and tertiaries blackish, but with the markings more elongated and reaching to the shaft. The whole under parts are yellowish white, numerously barred with transverse dark undulating lines; tail black, with spots and bars on both webs, the tips ashy grey above and silvery white below; tibia feathered to the knee. The female is larger, and only differs from the male in this respect and its duller tints.

Length.—14 to 16 inches, wing 8 to 8·25, tail 3·25, bill at front 3 to 3·2 (upper mandible), tarsi 1·5 to 1·8, irides dark brown, legs livid fleshy, as also is the bill with a tinge of grey.

Hab.—Europe, Egypt, India, Java. In India it is a summer resident on the wooded ranges of the Himalayas, and a winter visitant to the Neilgherries and the higher ranges of Southern India, parts of the Punjab, Nepaul, Sylhet and Bengal, frequenting damp situations, and feeding on worms, snails, slugs, &c. In Sind it is extremely rare, and is known only by a single specimen obtained at Kurrachee. It is also said to occur in North Canara and the Concan, also in Persia, Beloochistan and Afghanistan.

Gen. **Gallinago**,—*Steph.*

Characters the same as in *Scolopax*. Tibia not feathered to the knee; tail of 16—18 feathers.

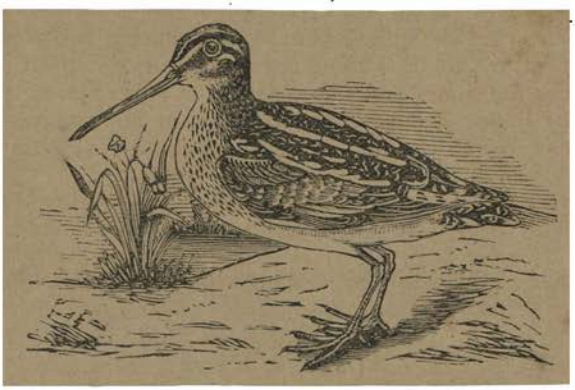
Gallinago sthenura, *Kuhl.; Jerd. B. Ind.* iii. p. 674; *Str. F.* vol. i. 423, 496; ii. 294, 335; v. 212; *Murray, Hdbk., Zool., &c., Sind*, p. 214. G. Horsfieldi, *Gr. Ill. Ind. Z.* pl. 54.—THE PIN-TAIL SNIPE.

Crown dark brown or black, with a mesial longitudinal pale line; face white, divided by a dark line from the nostrils to the eye and extending to the ear-coverts; there is also in some specimens a faint line from the ear-coverts to in front of the neck on each side, but not meeting; chin and throat white; neck in front and behind pale fawn brown, barred, streaked or spotted with brown or dark brown; sides of the abdomen like the breast, and transversely barred; middle of abdomen white, barred in some specimens; upper back, scapulars and wing-coverts brown, darker on the mantle and scapulars, the feathers of which are broadly edged with yellow and spotted and streaked with rusty; the scapulars, tertials and wing-coverts barred with the same; lower back, rump and upper tail-coverts rufescent brown, barred with dusky; under wing lining and axillaries white, distinctly and richly barred with blackish brown; tail basally dark brown followed by a

large oval rufous or rufous buff patch, and a narrow subterminal dark band, tipped pale rufous or the colour of the oval patch; primaries and their coverts, also the secondaries, pale brown or dusky, narrowly margined at the tip with white, both webs unicolorous.

Length.—9·75 to 10 inches, wing 4·8 to 5·4, tail 2 to 2·5, tarsus 1·12 to 1·25. Females are larger. Legs and feet plumbeous with a greenish tinge, irides deep brown, bill 2·2 to 2·6, gape and base of bill greenish, rest of bill pale horny with a dusky tip for about one-third its terminal length. In the females the bills average from 2·45 to 2·7.

Hab.—Nearly throughout India, rare in the Punjab, N. W. Provinces and Sind, also in Rajputana, Kutch and Kattiawar; fairly common in N. Guzerat, Central India and Khandeish. In Bombay, Concan generally, and the Deccan, as well in the Nizam's Provinces, it is plentiful, also in Lower Bengal, east and west of the Brahmapootra. It is recorded from Araccan, Pegu, Tennaserim, the Andamans and Nicobars, where it is most commonly met with. This snipe is a migrant; arrives in Sind about the middle of August, and leaves about the end of March or middle of April. Rice fields, mud swamps, and the vicinity of large rivers, jheels and tanks, where there are sedges and rushes, are the selected spots of the Pin-tail, at least in Sind.



Gallinago scolopacina, *Bp.; P. E.* 883; *Gould. B. Eur.* pl. 321,2; *Jerd. B. Ind.* iii. p. 674, No. 871; *Murray, Hdbk., Zool., &c., Sind*, p. 214. Gallinago gallinaria, *Gmel.; Str. F.* vol. ii. 294, 335. (*Soorkhab*, Sind.)—The Common Snipe.

Crown of the head black, with a mesial longitudinal white, yellowish, or rusty white line; a superciliary on each side from the base of the upper mandible of the same colour, and a dark streak below it to the eye; sides of the head spotted with dusky grey, tinged with ferruginous brown; chin and throat white, or nearly white; neck on the sides and in front yellowish white, spotted with brown; breast white, brown, pale yellowish or ferruginous on the upper part, and spotted with dusky; the sides greyish white, barred with dark brown; back and scapulars velvetty black, the feathers broadly edged with yellow, and barred and spotted with chestnut brown; the yellow edges to the

feathers forming four conspicuous lines on the back; upper tail-coverts barred with alternate bars of dusky black and pale yellowish brown, somewhat rufescent; the under tail-coverts pale yellowish-fawn, also barred with dusky or dark brown; the middle of the abdomen is white, in some specimens tinged with pale buffy fawn; axillaries and flanks white, barred with dusky or dark brown, but not so broadly, close and numerous as in *Stenura*; under wing lining white, a few bars only on the edge of the wing; a white patch always conspicuous in the centre of the wing; greater and lesser wing-coverts dusky or dark brown, barred with rufescent, and edged and tipped with pale white or cream colour; primaries dusky or dark brown, *the first with its outer web white;* secondaries dusky or dark brown, broadly tipped with white; the outer edges of their inner webs white, and striated with dusky; the inner webs of the primaries also whitish basally and mottled minutely with dusky; tertiaries rufescent, barred with dark brown; tail black at the base, with an oval patch of rusty orange or ferruginous, then a subterminal narrow band, and tipped with buffy or pale reddish yellow, in some specimens white; legs pale green; bill terminally for one-third or more of its length deep brown, the rest basally horny brown with a green and yellowish tinge; its length from gape, of males 2·39 to 2·7, at front 2·43 to 2·75; of females 2·62 to 3·0 at front, rather flat at the tip.

Length, Male. — 9 to 11 inches, wing 4·9 to 5·5, tail 2·5 to 2·8. *Females* larger.

Hab.—Throughout India as a winter visitant, also Persia, Beloochistan and Afghanistan. Arrives in Sind about the beginning of September and leaves in April, and with the Jack Snipe is tolerably abundant every where. It is a very vigilant bird, and in consequence difficult to shoot, especially in bogs and moist localities where rushes are present. In such retreats, three, four or half a dozen may be seen at a time, walking leisurely, with head erect, and constantly on the alert; and at the first note of alarm, they rise, and soon get out of gun-shot. This species, it need hardly be mentioned, is held in much esteem for the table.

Gallinago gallinula. The Jud-Cock.

Gallinago gallinula, *Lin.*; *P. E.* 884; *Gould. B. Eur.* pl. 322; *Jerd. B. Ind.* iii. p. 676, No. 872; *Str. F.* vi. 459; *Murray, Hdbk., Zool., &c., Sind*, p. 214.—THE JACK SNIPE or JUD-COCK.

Crown of the head with a mesial longitudinal black streak from the top of the upper mandible; on each side of this a yellowish or cream coloured streak extending above the eye as a superciliary, and in some specimens separated from the orbital region by a dark streak; a dusky line from the gape to the eye, and another from below it curving downwards to the ear-coverts; the space between the two streaks white or cream colour; chin and throat white, greyish, or pale brown; sides of the head greyish, greyish white, or brownish white, spotted with brown and pale red; neck behind and nape ferruginous or greyish brown, streaked or spotted with dusky; breast pale yellowish brown or dusky, spotted or dashed with darker brown; abdomen white; flanks dashed with brown and pale ferruginous; axillaries pure white, with faint, almost obsolete dusky markings; back and scapulars rich black, with bronze green and purple reflections, the feathers of the upper back and scapulars edged on their outer webs broadly with rich cream yellow, forming two conspicuous longitudinal bands along each side; lower back and rump glossy blue black, (specimens in August very narrowly margined with albescent); primaries dusky, the basal half of the first paler, *not white;* inner primaries narrowly margined at the tip with albescent; secondaries dusky, broadly tipped with white; tertiaries dusky on their inner webs, spotted and streaked with reddish or yellowish brown on their outer webs; tail dusky or dark brown, edged near the tips with pale ferruginous; under tail-coverts white; legs and feet pale greenish; irides deep brown; bill dark brown at the tip, 1·6 to 1·8 inches in length at front, wing 4 to 4·6 inches, tail 1·8 to 2·2.

Hab.—Every where in India, and more plentiful than the common snipe, with which it is generally associated. In Sind small parties begin to arrive about the 26th of August, or a few days earlier than the common snipe. It is a difficult bird to flush, seldom rising until nearly trampled upon. It prefers deep cover at all times, but I have often seen them on the oozy, semi-fluid mud of back waters, where there was not even a stubble for cover.

Gen. **Rhynchæa.**—*Cuv.*

Bill shorter than in *Gallinago*, curved downwards at the tip; wings rounded; tarsi long; tibia nearly entirely bare.

Rhynchæa bengalensis, *Lin.*; *P. E.* 881; *Jerd. B. Ind.* iii. p. 677; *Str. F.* iv. 15; v. 223; vi. 459; *Murray, Zool., &c., Sind*, p. 214.—The Painted Snipe.

Crown of the head with a broad mesial longitudinal line, bordered by dark brown, nearly black feathers, which form a line from the sides of the upper mandible to the nape, where it is broader than in front; a yellowish buff circle round the eye, and a line behind it; chin and throat whitish, the feathers with some faint dusky spots; neck in front and breast olive brown, the feathers with white spots and bars; the feathers on the lower part of the sides and middle of the breast nearly dark brown, forming a dark pectoral band, another similar band below this with a white interspace, but not meeting on the breast; hind neck olivaceous, finely marked with dark transverse striæ; mantle

and scapulars dark brown, with dark margined buffy yellow and white bars; wing-coverts and tertiaries pale olive, with black margined transverse bands or bars of rufous buff, broader and more conspicuous on the tertiaries; outer web of the first primary grey brown, the rest paler, and all with 5—6 buff or rufous buff ocelli; the interspaces between the basal three ocelli deep black, and between the terminal ones greyish brown; inner webs of primaries with white bars and dark wavy lines and marblings; secondaries ashy grey, ocellated with buff on their outer webs, the interspaces basally black, and terminally with dark brown wavy lines; their inner webs, like the primaries, with white bars and wavy lines, and the tips margined with white, the patterns showing through paler on the under side of the wing; tail ashy grey, with buff ocelli on both webs, and tipped with buff; abdomen, vent and under tail-coverts white. The female has the lores, sides of the face, upper breast and back of neck chestnut, the feathers edged whitish on the upper breast; back, scapulars and wing-coverts, also the tertiaries dark olive with narrow, close, black striæ, the outermost tertials white, otherwise as in the male. Bill reddish brown; irides deep brown; legs and feet greenish.

Length.—9 to 10 inches, wing 4·9 to 5·2, tail 1·5 to 1·8, bill at front 1·8 to 2 inches.

Hab.—Sind, Kutch, Kattiawar, Rajputana, Central India, Punjab, N. W. Provinces and Ceylon. Breeds in Sind during May and June, and in nearly all localities where it occurs.

Sub-Family, LIMOSINÆ,—Godwits.

Bill much lengthened, curved or straight from the base, or turned upwards; tail short and even; toes long, united at the base.

Gen. **Limosa**.—*Briss.*

Bill sub-curved at the tip, inclined upwards; 1st quill longest; outer toe united to the middle as far as the first joint; tibia far more than two-thirds its length; tarsi long, hind toe half the length of the outermost.

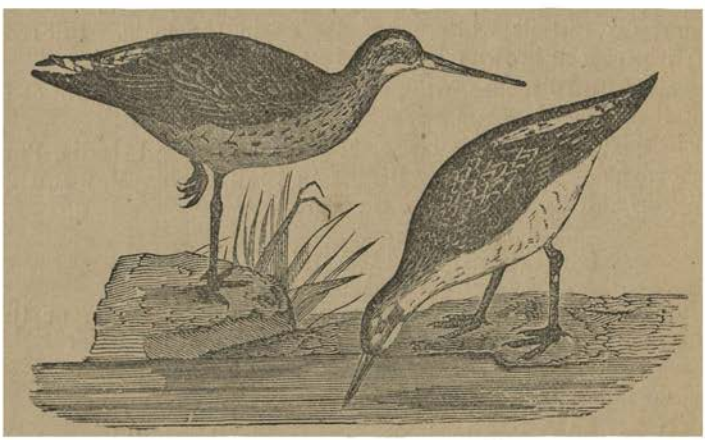
Limosa ægocephala, *Lin.; P. E.* 874, 916; *Gould. B. Eur.* pl. 305; *Jerd. B. Ind.* iii. p. 681; *Str. F.* i. 235; iv. 16; vi. 460; *Murray, Hdbk., Zool., &c., Sind*, p. 215.—The Black-tailed Godwit.

In winter plumage, the entire head, back of the neck, back, scapulars and breast pale earthy grey, darker on the scapulars and back, where each feather is dark shafted; superciliary stripe, chin, throat, also the abdomen and under tail-coverts white; rump white, the feathers of the upper tail-coverts black for their terminal half; tail white at the base, the terminal two-thirds tipped black, the outer feathers for their terminal third only, and all more or less narrowly tipped white; primaries and their coverts dusky brown, the inner primaries basally white, and all white on their inner webs; secondaries dusky terminally, white basally, and some of the tertials with their outer webs white; greater

wing-coverts broadly edged with white, also some of the hinder primary coverts; shoulder of wing dusky brown, also the lower back; neck in front and flanks greyish white.

Length.—16 to 18 inches, wing 7·75 to 8·75, tail 3·12 to 3·5, bill at front 3·7 to 4·5, of a dull reddish colour at base and dusky at the tip, legs dusky greenish, irides dark brown.

Hab.—Nearly throughout India during winter. Rare in Southern India, the Concan and the Deccan. Common in Kutch, Kattiawar and Rajputana, also in Beloochistan, Persia and Afghanistan. In Sind this species is numerous every where behind the tall grass, along the edges of the Munchur Lake, in the shallow pools, wading up to their body, and often swimming across deeper spots if beyond its standing depth. It is held in much esteem for the table, being equal to jack and the common snipe, especially those that have been feeding in rice fields.



Limosa lapponica. The Bar-tailed Godwit.

Limosa lapponica, *Lin.; P. E.* 900; *Gould. B. Eur.* pl. 306; *Hume, Str. F.* i. p. 236; *Murray, Hdbk., Zool., &c., Sind,* p. 216.—THE BAR-TAILED GODWIT.

"In the winter plumage there is a broad indistinct white superciliary band, and the feathers immediately below the eye are also white; the chin and throat are pure white; the forehead, the whole top, back and sides of the head, and the neck all round brownish white, closely streaked with darker brown, the streaks very minute on the sides of the head, somewhat larger on the front of the neck, and darker and stronger on the head and back of the neck, where but little of the white remains visible. The upper back pale earthy brown, each feather with a narrow dark brown central shaft-stripe and mostly margined somewhat paler. The breast pale greyish brown, more or less obscured by the albescent tippings to the feathers, and some of the feathers with inconspicuous darker shafts; the feathers of the central

portion of the breast, if raised, will be found to be not merely tipped whitish, but to be also obscurely barred with white; the abdomen, vent, and lower tail-coverts are pure white, as are also the axillaries and wing lining; the rump is white with a few cuneiform or heart-shaped blackish brown spots; upper tail-coverts white, with narrow irregular arrow-head bars; tail feathers grey brown with dark shafts tipped white, and mottled with white on the inner webs of the exterior ones, in some with traces of darker transverse bars; the primaries and their greater coverts black; the shafts of the first two or three white, subsequent ones brownish white; scapulars and tertiaries pale brown, darker shafted, margined paler, and many of them more or less tinged with ashy; the lesser and median coverts like the scapulars, but margined whitish; secondaries brown, paler on their inner webs, and margined on both webs and on the tips with white, as indeed are also, so far as the tips are concerned, the later primaries, though less conspicuously so; the greater secondary coverts are more ashy brown, narrowly margined with white. In one specimen, which appears to be further advanced, the lateral tail feathers are distinctly barred blackish brown and white; the cuneiform barrings on the rump and upper tail-coverts are more marked; the axillaries are all strongly barred; the feathers of the sides and flanks, and also the lower tail-coverts, exhibit numerous arrow-head bars; and one or two rufous or chestnut feathers with black bars have begun to show themselves on the breast."

The summer plumage is thus described by Temminck:—

"*Male*.—Upper part of the head and occiput blackish brown, mixed with streaks of reddish yellow; a band of the latter colour over the eyes; lores blackish brown; cheeks and throat of a yellowish red; all the lower parts of the body including the under tail-coverts pale yellowish red; upper part of the back and scapulars blackish brown, marbled with reddish yellow and whitish grey; lower part of the back and rump white, marked with longitudinal yellowish red spots; the tail marked with brown and white bars, those of the latter tint irregularly distributed, and disposed more or less longitudinally; quills black from their tip, the remaining part towards the bases blackish brown, with their inner webs whitish grey, marbled with pale brown; the secondaries grey, with the shafts and margins white.

"*Female*.—The head and lores as in the male; the throat white, marked with reddish grey; cheeks and neck very light reddish, with numerous brown streaks, which become broader, and form small transverse brown and white bars on the sides of the breast; the latter and the belly marbled with white and very pale reddish; the abdominal part white; the lower tail-coverts reddish white, with light brown bars.

"*Length of Male*.—14·5 to 14·8 inches, expanse 27 to 27·75, tail from vent 2·7 to 3·3, wing 7·8 to 8·4, tarsus 2, bill at front 2·8 to 3·1, weight 8·1 oz.

"*Length of Female.*—15·75 inches, expanse 28, tarsus 2, tail 3, wing 8·4, bill at front 3·65, weight 9 oz.

"The legs and feet are black, in some dusky plumbeous; irides brown; bill pinkish for about the basal half, black or dusky on the terminal half."—"*Hume, S. F.* vol. i. p. 236."

Gen. **Terekia.**—*Bp.*

Bill recurved, long, slender; tarsi short; toes narrowly webbed; hind toe less than half the size of the outer one.

Terekia cinerea, *Guldst.*; *N. Comm. Petrop.* xix. t. 19; *Gould. B. Eur.* pl. 307; *id. B. Asia*, vi. pl. 34; *Jerd. B. Ind.* iii. p. 682; *Str. F.* i. 237; ii. 296; vi 460; *Murray, Hdbk., Zool., &c., Sind*, p. 217.—The Avocet Sand-Piper.

Forehead, chin, throat, sides of the head and neck in front greyish white, with ashy striæ; back, scapulars, tertials, rump and upper tail-coverts ashy brown, the feathers with dark shafts; feathers of the median wing-coverts narrowly tipped with white; primaries dark brown, the 1st quill with a white shaft; secondaries dusky, broadly terminated with white; shoulder and edge of the wing dark brown; tail concolorous with the back, the tips bordered with white; sides of the breast ashy grey, the feathers mesially darker; lower breast, abdomen, vent and under tail-coverts white. In an advanced stage of plumage—March—the entire upper parts are darker, the scapulars are terminated with black, the chin and throat become pale ashy grey, and there is a distinct fulvous orbital ring, the forehead and face become fulvescent, and the inner primaries tipped with white.

Length.—10 inches, wing 5 to 5·2, bill at front 1·9 to 2, orange at the base, the rest dusky or dark brown, tail 2 to 2·5, legs and feet pale orange, irides brown.

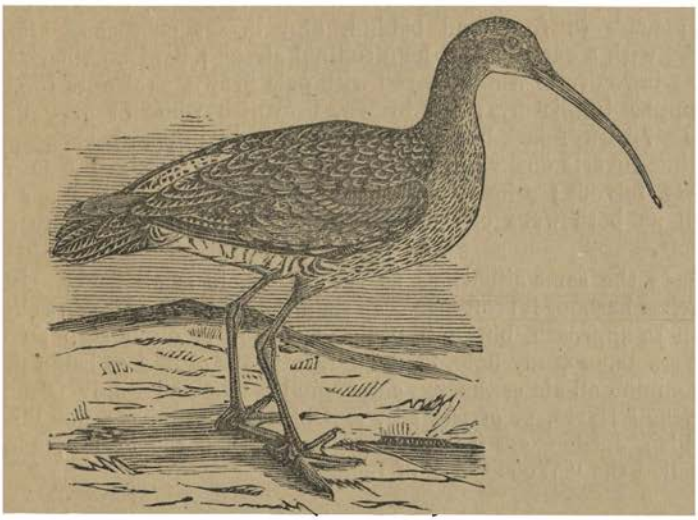
Hab.—Sind, the Mekran Coast, Kutch, Kattiawar, N. Guzerat, Northern and Southern India, affecting the sea coast, creeks and channels during winter, found also in N. E. Europe and New South Wales. According to Jerdon it breeds in Northern Asia, and is extensively distributed over Europe, Asia and Australia.

Sub-Family, NUMENINÆ.

Bill very long, slender, arcuate and compressed, with the tip hard and rather obtuse.

Gen. **Numenius.**—*Linn.*

Characters same as those of the Sub-Family; bill curved from the base; upper mandible slightly the longer; tarsi narrowly scutate transversely; hind toe slender with a rudimentary nail.



Numenius arquata. The Curlew.

Numenius arquata, *Lin.*; *P. E.* 818; *Gould. B. Eur.* pl. 302; *Jerd. B. Ind.* iii. 683; *Str. F.* i. 237; *Murray, Hdbk., Zool., &c., Sind*, p. 217.—The Curlew.

Head, neck behind and in front, also the breast rufescent ashy, or rufescent grey brown, the feathers with dark mesial longitudinal shaft-streaks; upper back and scapulars varying from dusky to dark brown, the feathers broadly edged fulvous or pale rufous; upper abdomen white, the feathers with dusky shaft-streaks; lower abdomen, vent and under tail-coverts pure white; lower back white; rump and upper tail-coverts also white, with dark shafts; tail fulvous white with transverse brown bars; chin and throat white, also a small space above the eye in some specimens; first five primaries and edge of wing dark brown, their inner webs mottled with white; secondaries dusky brown with transverse white bars on both webs half across only, the dark markings forming a rude saw, the edges and tips of the feathers white.

Length.—21 to 26 inches, wing 12 to 12·5, tail 4·5, bill at front 5 to 7·25, irides dark brown, legs and feet bluish grey.

Hab.—Throughout most parts of Europe, India, N. Africa, Egypt, Abyssinia and Palestine. Common along the sea coast and back waters in great numbers during winter, also along the banks of the Indus and Punjab rivers, and on all large inland sheets of water.

Numenius phæopus, *Lin.*; *P. E.* 842; *Gould. B. Eur.* pl. 303; *Jerd. B. Ind.* iii. 684; *Str. F.* ii. 297; *Murray, Hdbk., Zool., &c., Sind*, p. 217.—The Whimbrel.

Forehead and crown dusky brown with a mesial longitudinal streak; lores dark brown; superciliary stripe white, extending from the upper

side of the upper mandible; orbital feathers white; chin and throat white; neck in front and behind, and breast ochreous white, the feathers with a dark central longitudinal streak; flanks, axillaries and under wing-coverts white, barred with pale brown, as also are the rump and upper tail-coverts; tail brown, brownish white or grey brown, with 6—7 bars of dark brown; lower back white; upper back, scapulars and wing-coverts dusky or deep brown, the feathers edged pale white or dirty fulvous; primaries dusky or dark brown, their inner webs as well as both webs of the secondaries with white bars, not reaching the shaft.

Affects the same situations as the curlew, in small flocks. In the Kurrachee harbour it is oftener seen than the curlew, and is more shy and difficult to approach, but unlike the curlew it is often seen on open barren tracts, or sandy flats, far inland, in flocks of 3, 4 or half a dozen. It is common all along the sea coast, mud banks and sandy islands of estuaries of rivers, or of the sea, and like the curlew is a fine bird for the table; Jerdon says it is perhaps better than the curlew, and has been called the "Woodcock" of Bengal.

Sub-Family, TRINGINÆ,—Stints, &c.

Bill rather long, flat and wide, keeled near the tip, somewhat flexible; nostrils in a groove extending two-thirds the length of the bill; wings long; toes divided or narrowly webbed.

Gen. **Philomachus**—*Moehr.*

Bill straight; first and second quills of wing longest; outer toe united as far as the first joint; hind toe short and elevated.

Philomachus pugnax, *Lin.; P. E.* 300, 305, 306; *Gould. B. Eur.* pl. 328; *Jerd. B. Ind.* iii. p. 687; *Str. F.* i. 239; iv. 17; *Murray, Hdbk., Zool., &c., Sind*, p. 219.—The Ruff—*Female*, Reeve.

In winter the plumage of these birds is very variable, the upper parts are from pale earthy to rich brown, the feathers with black or dark brown central spots and fulvous edges; the head, nape and neck behind paler; chin and throat white; neck in front and breast pale earthy or grey brown, the feathers margined at the tip with white; abdomen, vent and under tail-coverts white; primaries dark brown; secondaries paler, edged and margined at the tip with white; greater coverts tipped white, forming a wing band; the lesser and median ones black, edged with rufous or reddish brown, also the greater coverts in some stages. The plumage is so variable, that out of 50 skins or more, no two birds would be found alike. During summer or in their breeding plumage the males acquire a ruff, which is very variously coloured and stands erect behind the head, the face is covered with reddish tubercles and the upper parts and breast marked with transverse bars.

Length.—12 to 12·5 inches, wing 7·25, tail 2·5, bill at front 1·3, tarsus 2.

Bill dusky; irides brown; legs fleshy yellow.

Hab.—Throughout India and in great numbers during winter. Occurs also in Beloochistan, Persia and Afghanistan. Breeds in Europe. During spring on their return to the breeding grounds, generally the fens, they become very pugnacious, the females being "*causa terrima belli.*" Being polygamous, the Ruffs, on hearing the cry of a female, or seeing one, immediately rouses itself, and begins a fight with others; their combats are described as being both desperate and long; at the end of the fight the female, it is said, becomes the mate or prize of the victor. Buffon says—"they not only contend with each other in a single rencounter, but they advance to combat in marshalled ranks." "Their actions in fighting," according to Selby, "are very similar to those of a game cock, with the head lowered, and the beak held in a horizontal position; the ruff and every feather distended, the former sweeping the ground as a shield"; and he adds "that in such feuds their contests are often attended by fatal consequences."

Gen. **Tringa.**—*L.*

Toes edged by membrane; wings with the 1st quill longest; tarsi rather short; bill straight or slightly bent, obtuse at the extremity.

Tringa crassirostris, *Tem. et Schleg. Faun. Jap.* p. 107, pl. xiv.; *Str. P.* vol. i. p. 240; *Murray, Hdbk., Zool., &c., Sind*, p. 218. Tringa tenuirostres, *Horsf.; Gould. B. A.* vi. pl. 33.

The following is Mr. Hume's description of the species.

"In the winter plumage the upper surface reminds one not a little of that of *Totanus stagnatilis*. The whole lower parts are white, but the base of the neck in front and the sides are marked with numerous small brown striæ, and the upper breast, besides having more or less of these striations, is mottled with larger pale brown spots, here and there interspersed with conspicuous heart-shaped blackish brown spots, which are the first traces of the coming summer plumage. Lores, top, back and sides of the head and neck very pale greyish brown, all the feathers narrowly streaked along the shaft with dark brown; the upper back and whole mantle is a mixture of pale brown and ashy, most of the feathers with blackish shafts, more or less darkly centred, and all conspicuously, though narrowly, margined and tipped with white. Lower back and rump brown, the feathers narrowly and regularly margined with white; upper tail-coverts similar, but the white margins much broader, and the brown more or less obsolete on many of them. Tail feathers greyish brown, greyer and somewhat darker on the central ones, and paler and browner on the external ones; all are excessively, narrowly, in fact almost obsoletely, bordered with white. The primaries and their greater coverts are hair brown, most of the latter tipped white; the secondaries and their greater coverts are a pale somewhat greyish brown, all of them narrowly, but the coverts less narrowly of the two, margined with white. The wing lining, except just at the margin of the wing, which is mottled with brown, pure white; the axillaries white with traces of irregular, wavy pale brown bars. There are a few elongated triangular pale brown dashes on the flanks, and in some specimens one or two larger blackish brown spots pertaining to the summer plumage."

According to Schlegel the summer plumage is as follows:—

"Feathers of the head and neck each with a large dark brown longitudinal streak or spot on an albescent ground, which is tinged with brownish rufous on the nape. Feathers of the breast and nape brownish black, each with a whitish transverse band about the middle, often tinged with brownish red towards the middle. The rest of the lower parts and the rump pure white, spotted, except towards the middle of the abdomen, with broader or narrower dark spots. Back and wings brownish black, lighter on the wing-coverts; all the feathers spotted and bordered with a bright brownish rufous, gradually disappearing towards the edge of the wing. Lower wing-coverts white, becoming black at the base.

"Bill black, sometimes paler at the base of lower mandible; legs and feet dusky, greenish dusky, yellowish plumbeous or pale plumbeous, according, I suppose, to age or seasonal progress.

"*Length.*—11·35 to 12 inches, expanse 23·5 to 24, tail from vent 2·7 to 2·8, wing 7·1 to 7·3, bill at front 1·6 to 1·85, tarsus 1·4 to 1·55, wings when closed reach from 0·3 to 0·4 beyond end of tail."

Hab.—Kurrachee (Sind) and the Beloochistan Coast. Common during winter in the Kurrachee harbour and along the Mekran Coast. Recorded also from Australia and Java.

Tringa subarquata, *Gould.*; *P. E.* 851; *Pl. Col.* 510; *Gould. B. Eur.* pl. 328; *id. B. As.* pl. 32; *Jerdon, Birds Ind.* iii. p. 689; *Str. F.* i. 242; vii. 487; *Murray, Hadbk., Zool., &c., Sind*, p. 219.—The Curlew Stint or Sand-Piper.

Winter Plumage.—Bill curved downwards. Head, on the crown and sides, back of the neck and nape light greyish brown, streaked with darker brown and dusky black, with an olivaceous gloss; face and supercilia white, and a dark streak from the gape to the eye; sides of the neck and in front greyish, streaked with brown; breast the same; abdomen and upper and lower tail-coverts white; back, scapulars and wing-coverts ashy brown, the shafts darker; tail ashy grey, edged with white; primaries dusky brown, also the secondaries, which are tipped with white; axillaries white; lesser coverts grey, the shafts darker.

Length.—8—10 inches, wing 5, tail 1·75, bill at front 1·6. Bill black; irides brown; legs dusky grey. In summer plumage the forehead is whitish, mixed with pale reddish brown; supercilia pale yellowish white; chin white; head, neck and nape ferruginous with dark markings; throat, breast and upper abdomen chestnut; in a specimen obtained on 20th May the feathers are all narrowly edged with white; back, scapulars and tertiaries black; also the lesser coverts, the feathers edged with chestnut.

Hab.—India generally, also Beloochistan, Persia and Afghanistan. Recorded from Cashmere and Egypt, also from Australia and Java. Found commonly along the Sind and Mekran Coasts and on the large dhunds, not far inland. It occurs in Kutch and Kattiawar and the Bombay Coast in some numbers, also in the Kurrachee harbour.

Tringa cinclus, *Lin.*; *P. E.* 852; *Gould. B. Eur.* pl. 329; *Jerd. B. Ind.* iii. 690; *Str. F.* i. p. 242; *Murray, Hdbk., Zool., &c., Sind*, p. 220. Tringa alpina, *L.*—THE DUNLIN.

Crown of the head, lores and cheeks ashy brown; a pale white supercilium from the base of the bill over each eye; back and scapulars pale ashy brown, the feathers dark shafted and edged paler; lesser and median coverts brown, edged paler, almost ashy; greater coverts brown, tipped with whitish; throat, breast, belly, vent and under tail-coverts pure white, the breast with a few brown streaks; tail with the two central feathers dusky or deep brown, the rest ashy and edged whitish.

Length.—6·5 to 7·5 inches, wing 4·5, tail 1·87, bill at front 1·25, black; legs greenish dusky, irides brown.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Guzerat, Kutch and Kattiawar Coast. A winter visitant, arriving about the middle of September. In the Kurrachee harbour the Dunlin is simply numerous, also on the Mekran Coast, where they may be seen running nimbly near the edges of the sea or skimming along near the surface in fairly large flocks.

Tringa minuta, *Leisl.*; *Naum. vogt.* t. 184; *Gould. B. Eur.* pl. 332; *Jerd. B. Ind.* iii. p. 690; *Str. F.* i. 242; *Murray, Hdbk., Zool., &c., Sind*, p. 220.—THE LITTLE STINT.

In winter the upper parts are ashy or pale earthy brown, the feathers of the back, scapulars, tertials and lesser and median wing-coverts mesially dusky or dark brown, and in some very narrowly edged with whitish. There is a dark spot in front of the eye, and a pale white supercilium; the chin, throat, centre of the breast and rest of the under surface, including the vent, axillaries and under tail-coverts, are white; sides of the breast ashy brown; primaries mostly white shafted, dusky brown, slightly paler on their inner webs; secondaries white, basally and also narrowly tipped with white; greater wing-coverts tipped with white, forming a conspicuous wing band; rump, upper tail-coverts and two central tail feathers dusky or dark brown; lateral tail feathers pale ashy.

Length.—6·6 inches, expanse 13·1, tail 2·3, tarsus 0·9, wing 3·8, bill at front 0·6; irides deep brown, legs black.

Hab.—Nearly throughout Europe and India, also Java, Formosa, Australia and China. In Sind, along the coast; also in the Kurrachee harbour; inland on the large pieces of water and on the Munchur Lake, this Little Stint is extremely common, also on the Mekran Coast, the Punjab, N. W. Provinces, Oudh, Bengal, and Ceylon. Occurs in Persia, Beloochistan (Quetta), and Afghanistan, and in fact has a very wide distribution. In the Concan, Deccan and Southern India generally it is equally abundant.

Tringa Temminckii, *Leisl.*; *Pl. Col.* 41, 1; *Gould. B. Eur.* pl. 333; *Jerd. B. Ind.* iii. p. 691; *Str. F.* vol. i. 242, 243, 244; *Murray, Hdbk., Zool., &c., Sind*, p. 220.—THE WHITE-TAILED or TEMMINCK'S STINT.

Upper parts as in *minuta*; chin, throat and supercilia white; a dark spot in front of the eye; breast and lower neck ashy brown; belly, vent and under tail-coverts white; four central tail feathers dusky brown, the rest white; legs pale horny green, or greenish olive.

Length.—6 to 6·25 inches, wing 3·8, bill at front 0·7, irides deep brown.

Hab.—As the last, and associated with it everywhere.

Limicola platyrhyncha, *Tem.*; *Gould. B. Eur.* pl. 331; *G. R. Gr. and M. G. B.* pl. 156, 2; *Jerd. B. Ind.* iii. p. 692; *Str. F.* i. 246; *Murray, Hdbk., Zool., &c., Sind*, p. 220.—The Broad-billed Stint.

In winter, the crown of the head, back, scapulars and wing-coverts are ashy brown, tinged with rufous; neck and cheeks white, spotted with brown; primaries and tail brown, the latter edged with pale reddish ashy; lower parts white; the flanks, breast and under tail-coverts tinged with rufous. In summer dress the Broad-billed Stint has the crown of the head brownish black, varied with greyish; the neck on the sides and in front greyish white, with black spots, and tinged with buffy; chin white, with a few dark spots; lower back black with fulvous white or rufous margins to the feathers.

Length.—6·5 to 6·75 inches, wing 3·9 to 4·32, bill at front 1·27 to 1·37, tarsi 0·94; irides deep brown, legs and feet dusky black.

Hab.—The Indian Coast generally. Occurs commonly at Kurrachee and along the Mekran Coast, also at Kutch, and in Bengal.

Gen. **Calidris.**—*Cuv.*

Hind toe wanting, otherwise as in *Tringa*.

Calidris arenaria, *Lin.*; *Wils. Amer. Orn.* pl. 59, 4, 63, 3; *Gould. B. Eur.* pl. 335; *Jerd. B. Ind.* iii. p. 694; *Str. F.* vol. i. 244; iv. 343, 465; *Murray, Hdbk., Zool., &c., Sind*, p. 221.—The Sanderling.

In winter the forehead, lores, cheeks, chin, throat, breast, neck in front, belly, thighs, vent and under tail-coverts white; crown of the head, sides of the neck and breast, back and scapulars cinereous or ashy brown, the feathers with dark shafts; shoulders and edge of the wing dark brown; median and greater coverts like the back, dark shafted and tipped white; primaries dark brown, all white shafted; their inner webs ashy, and the four middle ones white on their outer webs, forming in the closed wing a wedge-shaped spot; secondaries brown or dusky, tipped with white; rump and upper tail-coverts brown, edged with white; tail brownish ash, edged with white, the two central feathers darker than the rest; bill black, 0·93 to 1 inch in length.

Length.—7·5, wing 4·75, tail 2, tarsus 0·92; irides deep brown, legs black.

Hab.—Kurrachee (Sind) Beloochistan Coast, Persia; Kutch, Guzerat, Concan and South India, also the Laccadives, the West Coast and the Irrawady Delta. In the Kurrachee harbour extremely abundant, associated with the Stints on the sea shore.

Sub-Family, PHALAROPODINÆ.

Bill straight, curved at the tip; tarsi short; toes lobed on the sides, united at the base; hind toe edged with narrow membrane.

Gen. **Phalaropus**.—*Briss.*

Bill long; 1st and 2nd quills of wing longest.

Phalaropus hyperboreus, *Lin.; Edw. B.* pl. 143; *P. E.* 766; *Gould. B. Eur.* pl. 336; *Jerd. B. Ind.* iii. p. 696; *Str. F.* i. 246; ii. 338; v. 290; vii. 487; *Murray, Hdbk., Zool., &c., Sind*, p. 221.—THE LESSER COOT-FOOTED STINT OR THE RED-NECKED PHALAROPE.

Crown, back of neck and nape dark lead or slaty; in winter the forehead is white, tinged with grey; the streak over the eye, and the crown and nape are blackish grey; the neck on the sides is fine yellowish red, which in winter wears away into white, with sometimes a tinge of purple; in front dark grey with a white edging; chin white; throat fine yellowish red; in winter white, with a slight tinge of pink; breast white with some streaks below on the sides of a pale ash colour, and in winter with a faint blush of purple red; back dark or blackish lead colour, the feathers with a margin of ash grey and brownish yellow; greater wing-coverts dark lead colour, tipped with white, forming a distinct bar across the wing in winter; lesser wing-coverts dark lead colour; primaries very dark brown, black in winter; secondaries margined with reddish yellow on the outer web, which in the winter plumage is white; tail brownish grey, margined with white; the two middle feathers darkest, nearly black; under tail-coverts white; legs and toes dusky greenish grey; claws black; lores dusky greenish.

Length.—7·25, wing 4·25, expanse 14·0, tail 2·19, bill at front 0·81.

Hab.—Kurrachee, Mekran Coast and Persian Gulf, also Afghanistan. On the Continent of Europe it occurs in France, Holland, Germany, Italy and Sweden.

Sub-Family, TOTANINÆ,—SAND-PIPERS.

Bill grooved as far as, or beyond, the middle, moderately long, the tip hard and pointed; nostrils narrow; hind toe long and slender, barely reaching the ground.

Gen. **Actitis**.—*Ill.*

Groove of the bill extending quite to the tip; 1st quill of wing longest.

Actitis glareola, *Lin.; Gould. B. Eur.* p. 315, 2; *Jerd. B. Ind.* iii. p. 697; *Str. F.* vii. 488; *Murray, Hdbk., Zool., &c., Sind*, p. 221.—THE SPOTTED SAND-PIPER.

Winter Plumage.—Crown of the head, forehead, nape and back of the neck dusky brown, the feathers with narrow white or greyish edgings; a dark streak from the base of the bill to the eye, and a white one above it; chin and throat white, rather sullied; fore neck and breast the same, but suffused with ashy brown, darker on the sides, where the feathers are indistinctly dark shafted; back, scapulars and tertials

dusky, the feathers edged with white or greyish white spots; axillaries white with transverse oblique dusky brown spots; primaries, secondaries and their coverts dusky brown, the shaft of the first quill and the tips of the later inner ones white; the greater wing-coverts margined and tipped with white; rump, upper and lower tail-coverts and abdomen white; tail, with the central feathers longest and barred with black and white alternately, the barrings oblique, the rest less broadly barred and decreasing on the outer ones to dusky markings on the outer webs only; legs pale olive green; irides deep brown.

Length.—8·5 to 9 inches, wing 5, tail 2, bill at front 1·2, tarsus 1·5.

Hab.—Common nearly throughout India, also in Beloochistan, Persian Gulf, and Afghanistan during winter.

Actitis ochropus, *Linn.; P. E.* 843; *Gould. B. Eur.* pl. 315, 1; *Jerd. B. Ind.* iii. 698; *Murray, Hdbk., Zool., &c., Sind*, p. 221.—The Green Sand-Piper.

In winter plumage the forehead, crown, nape and back of the neck are deep or dusky brown, the feathers streaked with white; a dark streak from the base of the bill to the eye, and a white one above it; chin and throat white; back and scapulars olive brown or brown glossed with greenish, each feather edged with small roundish spots, the spots on the scapulars distinctly margined behind with deep brown; primaries and their coverts and secondaries deep brown, none of them white shafted; wing-coverts dusky brown; *axillaries dusky or dark brown, with narrow oblique white bars;* abdomen, vent and upper and under tail-coverts white; tail white, broadly barred with deep brown, the middle feathers having four bars, and those next to them decreasing in number, the outer feathers on each side being pure white with sometimes a dusky subterminal spot on the outer web; legs and feet greenish grey; bill black; irides brown.

Length.—9·5 to 10 inches, wing 5·5 to 6, tail 3, bill 1·37, tarsus nearly 1·5.

Hab.—Throughout India, Beloochistan, Persia and Afghanistan, frequenting the banks of rivers, edges of lakes and large sheets of water; a winter visitant, seldom seen along the sea coast.

Actitis hypoleucus, *Lin.; P. E.* 850; *Gould. B. Eur.* pl. 318; *Jerd.* iii. p. 699; *Str. F.* ii. p. 299; *Murray, Hdbk., Zool., &c., Sind*, p. 220.—The Common Sand-Piper.

Forehead, crown, nape and back of the head ashy brown, streaked with dark narrow lines; supercilium white, also the orbital ring, chin and throat; sides of the face pale ashy with brown streaks; middle of the breast white, the sides mottled or streaked with brown, or entirely brown; back, scapulars, tertiaries and lesser wing-coverts ashy brown, glossed with green, and with fine transverse dark lines; greater wing-coverts ashy brown, tipped with white, which with the white bases of the secondaries form a conspicuous wing band; primaries and their coverts dark brown, the latter tipped with white, and all, except the first primary, and sometimes the second also, with a large white spot on their inner webs; lower back, rump and upper tail-coverts

ashy brown, with dark transverse bars; four central feathers of the tail like the back, the rest tipped with white and with dark spots along their edges; beneath white. Bill dusky; irides brown; legs pale green.

Length.—7 to 8 inches, wing 4·5, tail 2·4, tarsus 0·97 to 1, bill 0·97.

Hab.—Less common than the two preceding, affects the sea coast as well as lakes, &c., inland. Throughout India, Burmah, Malacca, &c.; also Beloochistan, Persia and Afghanistan.

Gen. **Totanus**.—*Bech.*

Bill slightly curved at tip, groove half the length of the bill; tarsi with narrow scales in front, otherwise as in *Actitis*.

Totanus glottis, *Lin.*; *Gould. B. Eur.* pl. 312; *Jerd. B. Ind.* iii. p. 700; *Str. F.* i. 247; *Murray, Hdbk., Zool., &c., Sind*, p. 221.—The Green Shanks.

In winter the forehead, except a few brown streaks in the middle, sides of the face, chin, throat, neck in front, and entire lower parts, including the under tail-coverts, are white, also the lower back, rump and upper tail-coverts; a dark streak from the base of the bill to the eye; crown of the head, sides of the neck and nape dusky, the feathers streaked whitish or greyish white; sides of the breast white, mottled with ashy brown; upper back and scapulars brown, the feathers edged whitish; the scapulars distinctly dark shafted, also the tertiaries; primaries dark brown, the shaft of the first quill white, and the edges and tips of the inner ones also white; secondaries ashy brown, tipped white; tail white, with narrow transverse dark bars, the outer ones nearly pure white; bill slightly curved upwards, dusky greenish, 2·2 in length; irides brown.

Length.—14 to 14·5 inches, wing 2·2, tail 3·75, tarsus 2·75.

Hab.—India generally during winter, along the sea coast, lakes, rivers, &c. Widely distributed. Recorded from N. E. Europe, Red Sea, Africa and Australia. Like all the *Totaninæ* it is excellent eating.

Totanus stagnatilis, *Bechst.*; *P. E.* 876, *Gould. B. Eur.* pl. 314; *id. B. As.* vi. pl. 37; *Jerd. B. Ind.* iii. p. 701; *Murray, Hadbk., Zool., &c., Sind*, p. 221.—The Little Green Shanks.

In winter the plumage of the upper parts are the same as *Totanus glottis*; shoulder of the wing black; entire under parts white; sides of the breast not so much spotted or streaked with dark brown; bill not curved upwards as in *glottis*; tail banded white and dusky.

Length.—10·5 inches, wing 5·25, tail 2, bill 1·62, tarsus 2·25; legs pale green, irides brown.

Hab.—The same as *glottis* and usually associated with it.

Totanus fuscus, *Lin.*; *Gould. B. Eur.* pl. 309; *Jerd. B. Ind.* iii. p. 702; *Murray, Hdbk., Zool., &c., Sind*, p. 222.—The Spotted Red Shanks.

In winter the forehead, crown, nape, back of neck and upper back ashy grey, finely streaked with dusky; supercilium white, and a dusky streak from the base of the bill to the eye; chin and throat white, sides of face white with some fine dusky streaks; breast and under parts mottled and barred with dingy ash brown and dull fulvous, or greyish white; upper back, scapulars, shoulder of wing and lesser coverts a glossy olive brown, darker on the upper back and tertiaries, all the feathers spotted on the edges with white; the wing-coverts also tipped with white; lower back white; rump barred with undulating lines of ashy brown and white; tail also barred the same; primaries dark brown, the inner ones pale brown, tipped and mottled with white; secondaries barred white and pale brown; legs deep orange red; bill blackish, orange at the base beneath.

Length.—13 inches, wing 6·75, tail 2·5, tarsus 2·8, bill 2·4.

Hab.—Throughout India during winter; usually solitary or in very small parties. It is a sea shore bird, but is also found on the edges of rivers, lakes, mud banks, &c. It is said to swim well, and also to dive when in danger.

Totanus calidris, *Lin.; P. E.* 845; *Gould. B. Eur.* pl. 310; *Jerd. B. Ind.* iii. 702; *Murray, Hdbk., Zool., &c., Sind,* p. 221.—THE RED SHANK.

Winter Plumage.—Forehead, crown, nape, back of the neck, upper back and scapulars cinereous or glossy olive brown, the feathers on the back and scapulars dark shafted; supercilium and orbital ring white; chin and throat white; sides of the face greyish white, with narrow brown streaks; neck in front and breast greyish white, with dusky or greyish brown linear markings; primaries dusky, their inner webs white; the first quill white shafted, and some of the inner ones white tipped; secondaries white; tertials like the back; wing-coverts olive brown, the greater ones tipped with white; axillaries, under wing-coverts, abdomen, vent and under tail-coverts white; lower back white; upper tail-coverts and tail white, barred with dusky.

Length.—11·5 inches, tail 2·7, wing 6·45, bill at front 1·7 to 1·9, reddish at the base, its terminal half dark brown, tarsus 2; irides brown, legs red.

Hab.—India generally during winter. Sind, Persia, Beloochistan and Afghanistan, Southern and Western India, N. W. Provinces and Oudh. Breeds in the North of Europe.

Totanus.—*Sp.*

Female.—Frontal zone greyish white, the feathers with mesial narrow brown streaks; crown of the head cinereous, the feathers edged with greyish white; an indistinct dusky spot between the base of the bill and the eye, and a white supercilium; chin and throat white; neck in front and on the sides greyish white, the feathers with narrow mesial dusky streaks; back of the neck ashy grey, also with mesial narrow dusky streaks; breast greyish white with dusky spots, which become

linear lower down and on the sides and flanks, forming interrupted lines; abdomen and under tail-coverts white; upper back, scapulars and tertials ashy brown, the feathers dark shafted; the tertials reach beyond the fourth quill, and are edged and tipped with fulvous white; *primaries dark brown, nearly black, paler on their inner webs, and all white shafted, except at their tips;* secondaries ashy grey, white-shafted and margined and tipped with white; greater, median and lesser coverts ashy grey, the feathers dark-shafted and edged and tipped with white, more broadly on the median and lesser wing-coverts; first two rows of feathers on the shoulder earthy brown, edged rufescent; axillaries and thigh-coverts white; lower back and rump dusky brown, the feathers edged and tipped with white; upper tail-coverts the same, but the brown very much paler; tail pale earthy brown, the feathers with distinct pale margins and tips, the central feathers very slightly darker; tarsi short, 1·37 inches; toes slender, fringed on the sides and webbed about $\frac{1}{8}$ inch; mid-toe and claw 1·12; tail from vent 2·62; bill at front 1·62; upper mandible slightly the longer and bent over at the tip; wing 7·12, 1st quill longest; irides dark brown.

Length.—About 11·5 inches (mounted specimen); legs and feet greenish yellow. This is either a new species or an aberrant from of *Totanus*. It is quite unlike any of the other species, except *Totanus Haughtoni* with the figure of which in the April number of the Ibis, 1883, pl. iv, it agrees in a few characters. The markings of the breast and upper parts agree very well, but the lower back, rump and upper tail-coverts are not white as in that species or form. These are dusky with whitish edges and tips. Again in the webbing of the toes, this Kurrachee specimen differs from *T. Haughtoni* in having only one-eighth inch of a web, the fringe however is quite apparent. The palatal recurved horny papillæ referred to by Mr. Hume are also present.

In measurements however there is a wide difference. Mr. Hume gives:—

	Length.	Expanse.	Wing.	Tail.	Tarsus.	Bill at Gape.	Bill at front.
Male	13· 2	22·25	7· 3	3· 0	1·85	2· 5	2· 1
Females ...	12· 9	22· 3	7· 0	3· 0	1·65	2· 2	1·92

The Kurrachee specimen is a female and measures—

11· 5	.....	7·12	2·62	1·37	1·75	1·62

These measurements it will be seen will not fit any of the other species of the genus.

Hab.—Kurrachee (Sind) in the harbour during winter. This single specimen was obtained in November 1882.

Sub-Family RECURVIROSTRINÆ.—*Bp.*

Nostrils narrow, membranous; tail short and rounded; tarsi long, covered with reticulated scales; bill long and slender, recurved in one genus.

Gen. **Recurvirostra.**—*Linn.*

Bill long, thin, the keel flattened, the tips turned upwards; toes united by webs; hind toe short.

Recurvirostra avocetta, *Linn*; *P. E.* 353; *Gould. B. Eur.* pl. 289; *Jerd. B. Ind.* iii. 1, 248; *Murray, Hdbk., Zool., &c., Sind*, p. 222.—The Avoset, Scooper or Crooked-bill.

Forehead in some specimens faintly white, otherwise black; crown, lores, nape and back of the neck black; scapulars, lesser wing-coverts and upper tertials black; primaries black, some of the inner ones with their inner webs white; secondaries and some of the tertials white; chin, throat, neck in front, lower neck behind, lower back, rump, upper tail-coverts and entire under surface white.

Length.—17 to 18 inches, bill 3·5 inches, curved upwards, black; wing 8·5, tail 3, tarsus 3·62; irides red brown, legs pale bluish grey.

Hab.—Throughout India during winter; S. E. Europe, Lower Egypt, Senegal and Persia. Common in Sind, in large flocks inland, on almost every large sheet of water, especially on the Munchur Lake and along the edges of tanks, &c. Occasionally affects the sea coast and Kurrachee harbour, but by preference the inland waters. Breeds probably in Persia. In Upper India the Avocet is less common, and rather rare in Kutch, Jodhpore and N. Guzerat.

Gen. **Himantopus.**—*Briss.*

Bill long and straight; toes webbed only at the base; nostrils linear; hind toe wanting.

Himantopus intermedius, *Blyth, Cat.* 1573; *Gould. B. Eur.* pl. 289. Himantopus candidus, *Jerd. B. Ind.* iii. p. 704; *Murray, Hdbk., Zool., &c., Sind*, p. 222.—The Stilt.

In winter plumage, the forehead, lores, chin, throat, entire lower parts, lower back and rump white; crown of the head dusky or dark ash; neck behind ashy grey, the feathers tipped with white; upper back and scapulars brown, the feathers with pale tippings; primaries dark brown, the inner ones tipped white; secondaries also with white tips; central tail feathers very pale grey, the rest white. In the breeding plumage the primaries, secondaries, scapulars, tertiaries and upper back are rich glossy black, with greenish reflections; the crown of the head dusky or dark brown, spreading over and below the eyes.

Length.—15 to 16 inches, wing 8·5 to 9, tail 3, bill black, reddish at the base, 2·75 inches in length, tarsi 4·5 to 5·5; irides blood red, legs and feet lake red.

Hab.—India generally, in large flocks during winter, frequenting margins of lakes and ponds, also banks of rivers. Breeds in Sind during June in the Narra Districts. Eggs 2—4 in number, of a pale blue colour, spotted and speckled with dark brown and olive green. Incubation 18 to 20 days. The young are said to leave the nest immediately

they are hatched and hide themselves among very scanty cover. Found also in Beloochistan, Afghanistan and Persia, and probably Mesopotamia.

Family, PARRIDÆ.

Bill long, one and a half or twice the length of the head; nostrils lateral; wings spurred or with a tubercle; tarsi long; toes long with long claws.

Sub-Family, PARRINÆ.

Gen. Hydrophasianus.—*Wagl.*

1st and 2nd quill of wing equal and longest; primaries with lanceolate appendage to the tips.

Hydrophasianus chirurgus, *Scop.*; *Lath. Syn. Suppl.* pl. 177; *Gould. Cat. H. B.* pl. 77; *id. B. As.* pl. 3; *Jerd. B. Ind.* iii. 709; *Hume, Str. F.* i. p. 249; *Murray, Hdbk., Zool., &c., Sind*, p. 222. (*Peehoo*, Sind.)—The Pheasant-tailed Jacana.

In winter plumage, the forehead, crown, a streak from the base of the bill through the eye, extending down each side of the neck on to the breast and forming a pectoral gorget, also the back of the neck, dusky or pale hair brown, the feathers on the forehead and crown tipped with white; supercilium white, and a pale golden yellow line from behind the eye; back, scapulars, tertials and lesser wing-coverts glossy olive, or pale hair brown; the lower back, rump, upper tail-coverts and central tail feathers slightly darker, and the lesser wing-coverts mottled and barred transversely with white. Shoulder of wing spurred. First primary with an appendage, the shaft of 2nd, 3rd and 4th in some specimens hair like at the tip, all dark brown, and, except the first and second, broadly white on their inner and outer webs; greater coverts and secondaries, chin, throat, neck in front, abdomen, vent and under tail-coverts white; tail 3·5 to 4 inches. In breeding plumage the forehead, crown, entire face, chin, throat and neck in front white. There is a black patch on the nape; and the neck behind is shining golden yellow, edged on the sides with black; back, scapulars and tertiaries dark olive brown, with purplish reflections; rump and upper tail-coverts bronzed dark brown; tail black; breast and entire lower parts dark or deep dusky brown; shoulder of wing spurred; wing-coverts white; primaries as in the winter plumage.

Length.—18 to 20 inches, irides dark brown, bill plumbeous at the base and tipped greenish, 1·25 in length, tail 10 to 11 inches, wing 8 to 8·5, tarsus 2·12, middle toe and claw 3 inches, hind toe and claw 2 inches.

Hab.—Throughout India and Ceylon. Common in Sind on the Munchur and other Lakes, also in the Punjab and N. W. Provinces. Breeds in the Province from May to September, making a large floating nest. Eggs pear-shaped, of a beautiful bronze colour.

Family, RALLIDÆ.

Bill compressed, short, pointed, thick, wedge-shaped; nostrils in a short groove; legs stout; toes long; tarsi moderate; tail short.

Sub-Family, GALLINULINÆ,—Water-Hens.

Bill with the keel advancing on the forehead, where there is usually a casque; toes long and slender or bordered by a scolloped web; wings short and rounded; hind toe long.

Gen. Porphyrio.—*Briss.*

Bill very thick; casque large; mid-toe as long as tarsi, slender, not fringed with web.

Porphyrio poliocephalus. The Purple Coot.

Porphyrio poliocephalus, *Viell. N. Dict. Hist.* t. xxviii. p. 39; *Jerd. B. Ind.* iii. p. 713; *Str. F.* ii. 432; iv. 20; vii. 18; *Murray, Hdbk., Zool., &c., Sind,* p. 222. Porphyrio neglectus, *Schleg. Mus. Pars. B.* p. 53. (*Kaim,* Sind.)—The Purple Coot.

Occiput and nape, lores, and round the eyes greyish clouded with purple; cheeks, chin and throat the same, but with more of a purple tinge; neck in front and breast pale bluish; lower breast, abdomen, flanks, vent and thigh-coverts dark purplish blue; under tail-coverts white; back of neck, back, rump and upper tail-coverts purplish blue; scapulars, wing-coverts and outer webs of primaries pale greenish blue, the inner webs of primaries, secondaries and tertials dark brown or black; tail black, the feathers on the outer web edged with bluish.

Length.—18 inches, wing 10 to 10·2, tail 4·5, bill at gape 1·62, tarsi 3·62, mid-toe 3·62; casque and spot at base of bill cherry red, bill red, irides red, legs crimson.

Hab.—Throughout India and Ceylon, also in Persia, Beloochistan and Afghanistan. Common in Sind in suitable localities, but I do not believe they are anywhere as numerous as on the Munchur Lake, where, among the rushes, they are with the bald coot, simply innumerable.

Breeds in the Province from May to September, making a nest of rushes, &c., in the reedy grass. Eggs prettily marked on a greenish ground with spots, blotches and streaks of a reddish colour, lake red or rich red.

Gen. **Fulica.**

Bill moderate; nostrils lateral; casque small; wing with a tubercle at the shoulder; tail short; toes with lobate membrane.

Fulica atra, *Linn.*; *P. E.* 197; *Gould. B. Eur.* pl. 338; *Jerd. B. Ind.* iii. p. 715; *Murray, Hdbk., Zool., &c., Sind,* p. 223.—The Bald Coot.

Upper plumage black; hoary, dark ash, lead colour or dusky brown below; a spot below the eye, and the outer edge of the wings white; frontal disc or casque white; also the bill, which, in the breeding season, is tinged pale red; irides blood red; legs dull green, with a yellow, green and red garter in the breeding season.

Length.—15 to 16 inches, wing 7·5 to 7·75, tail 2, bill at gape 1·41.

Hab.—Throughout India and Ceylon, also Europe (Central and South) Egypt, Assam, Nepaul, Persia, Beloochistan and Afghanistan. In Sind it is numerous in suitable localities, but on the Munchur Lake, as Mr. Hume says (*Str. F.* vol. i. 249) "they would have to be counted not by thousands, but by hundreds of thousands * * * * * You can shoot nothing without knocking over some of these wretched coots." He also adds "that in no part of the world has he even seen such incredible multitudes of coot as are met with in Sind; in the Munchur Lake *par excellence.*"

Gen. **Gallicrex.**—*Blyth.*

Bill as in *Gallinula,* with the base of the bill extending on to the forehead and forming a fleshy protuberance; toes long; hind toe and claw about half the length of the mid-toe, claws curved.

Gallicrex cinereus, *Gm.*; *Blyth, Cat.* 1660; *Jerd. B. Ind.* iii. p. 716; *Str. F.* ii. 300; iii. 187; vi. 466; *Murray, Hdbk., Zool., &c., Sind,* p. 223. (*Korah,* Sind).—The Water Cock.

Male in Breeding Plumage.—Dull black, the feathers of the back, wing-coverts, rump and upper tail-coverts more or less edged with light brown; tertials dark brown, edged with pale whitey brown; edge of the wing white; quills dusky, the shaft of the 1st quill white; tail blackish brown, the outer feathers edged with pale brown; lower

wing-coverts dusky with whitish edges; bill greenish yellow, fine red at the base; the crest above one inch long, fleshy red; irides red; legs dull red.

Length.—16—17 inches, extent 23, wing 8½, tail 3·5, tarsus 3.—(*Jerd.*)

Female.—Top of head dull black or dusky brown; back of neck, back, scapulars, wing-coverts and tertiaries the same, the feathers edged with fulvous, more broadly on the back and wings; tail the same; sides of the face including a broad supercilium fulvous, in some with a rufescent tinge; chin and throat fulvous white; neck in front, breast and entire under parts brownish fulvous, the feathers with narrow transverse bars; thigh-coverts the same; primaries and secondaries dusky brown; outer web of first quill fulvous.

Length.—13—14 inches, wing 7, tail 2·5, bill at gape 1·25, tarsus 2·5.

Hab.—Sind, Lower Bengal, Tennaserim, South and Central India, Burmah and Malayana. Affects large swamps and marshes, also the vicinity of rivers. On the Aaral, at Sehwan, several may be seen in the early morning, issuing from the thick cover of tamarisk, fringing the banks, and running along the edge of the water.

Gen. **Gallinula**.—*Briss.*

Bill moderate, curved slightly at the tip; nostrils in a groove, placed about the middle of the upper mandible; bill extending on to the forehead and forming a small shield; shoulder of wing with a tubercle or spur; toes very narrowly edged by membrane.

Gallinula chloropus. The Water or Moor Hen.

Gallinula chloropus, *Linn.*; *P. E.*. 377; *Gould. B. Eur.* pl. 342; *Jerd. B. Ind.* iii. p. 718; *Str. F.* i. 250; vi. 466; *Murray, Hdbk., Zool., &c., Sind*, p. 223. Gallinula burnesi, *Blyth, J. A. S. B.* xiii. p. 736. (*Gajra, Jal Moorgh*, Sind.)—The Water or Moor Hen.

Top of head, nape and back of neck dusky olive brown; back, scapulars, tertiaries, wing-coverts and upper tail-coverts shining olive brown; primaries, secondaries and tail dusky brown, the outer web of the 1st quill white; a pale fulvous brown streak from behind the nostril on each side to the eye, and a patch of the same colour on the side of the head including the ear-coverts; under each eye a white spot; chin and throat white; breast dark bluish ashy, the feathers tipped with pale or dirty fulvous; lower abdomen white; vent feathers black; under tail-coverts white; feathers on the flanks long and lax, those falling on the thighs pale brown with a mesial white streak; bill reddish at base, greenish yellow at tip; irides red, an orange garter above the knee.

Length.—12—13 inches, wing 6·75, tail 3, bill at gape 1·1. In mature plumage the entire head and neck are dark brown, almost black, and the upper plumage darker olive brown.

Hab.—Diffused throughout India, Central and South Europe, Africa and Java. Occurs also in Beloochistan, Persia, Afghanistan, Eastern Turkistan, Nepaul and Cashmere, affecting small rivers and marshes. In the dhunds and jheels in Sind, also in the Deccan, Guzerat, and Rajputana it is extremely common, swimming about freely. During the day, on retreating to the edges of the tanks or dhunds, it lives concealed among the reeds and rushes. It is less shy towards evening, when it creeps along the margins of the waters among the long reeds in quest of aquatic insects, worms and seeds; breeds in Sind from June to August. The nest is a large structure of withered reeds and rushes, placed near the brink of the water; the female lays from 4 to 6 eggs; in shape they are long, oval or ovate pyriform, of a stone colour, with a pinkish tinge, speckled, spotted and blotched with reddish brown or red. It is said that the female never quits its nest without covering her eggs with the leaves of the surrounding herbage. The young are able to swim immediately they are hatched.

Gallinula phœnicura, *Penn.*; *P. E.* 896; *Horsf. Zool. Res. Java*, pl.; *Jerd. B. Ind.* iii. 720; *Str. F.* ii. 300; *Murray, Hdbk., Zool., &c., Sind*, p. 223. (*Kurrahee*, Sind).—The White-breasted Water-Hen.

Forehead, lores, entire face, chin, cheeks, throat, neck, breast and abdomen white; crown of the head, nape, neck behind, back, scapulars, wings, flanks and tail black, with greenish reflections; outer web of first quill white; lower abdomen, vent and under tail-coverts deep chestnut; bill yellow with a tinge of green; irides blood red.

Length.—12—13 inches, wing 6·5, tail 2·5, bill at front 1·5.

Hab.—Sind and throughout the Indian Peninsula, Ceylon and Burmah. In Sind not uncommon along the canals and the Indus. Breeds from May to August. Eggs greyish, with a light reddish tinge, spotted and blotched with various shades of red and bluish grey, affects generally the heavy undergrowths along the edges of canals.

Sub-Family, RALLINÆ,—Rails.

Forehead with a nude shield; bill compressed, slender; toes shorter than in the *Gallinules;* shoulder of wing with a tubercle or short spur.

Gen. **Porzana**.—*Viell.*

Wings moderate, rounded; tail short; toes long, about the length of the tarsus.

Porzana maruetta, *Briss.*; *Jerd. B. Ind.* iii. p. 722, No. 909; *Str. F.* iv. 21; *Murray, Hdbk., Zool., &c., Sind*, p. 224. Rallus porzana, *Lin.*; *P. E.* 750; *Gould. B. Eur.* pl. 343.—The Spotted Rail.

Forehead ashy brown; crown and nape dusky, streaked with ferruginous; superciliary streak extending behind the eye ashy grey, spotted with white; hind neck dusky, minutely freckled with black and white. Upper back and scapulars dark brown, almost black, the feathers broadly margined and tipped with ochreous olive and usually the margin of one or both webs with linear spots and streaks of white; lower back and rump dusky brown, the feathers narrowly barred with white; wing-coverts like the back, the outer margin of both webs with two pairs of white, black-edged spots; tertiaries dark brown on their outer webs, and with 6—7 narrow, oblique white bars; their inner webs rufescent brown; primaries and secondaries pale hair brown, the outer web of the first quill and bastard primary, also the edge of the wing white; the margins of the outer webs of the other primaries tinged with pale rufescent; axillaries dark brown with transverse white bars; chin and throat greyish white; breast olive brown; the feathers barred with white; abdomen ashy white; flanks olive brown, barred transversely with black and white; tail rufescent brown, mesially dark brown; vent and under tail-coverts rufescent white; bill greenish yellow, orange at the base; irides reddish brown; legs bright yellowish green.

Length.—8·8 to 9 inches, wing 4·5 to 4·8, tail 1·82 to 2, bill at front 0·75 to 0·9, tarsus 1·4, mid-toe and claw 1·6.

Hab.—Sind, Punjab, N. W. Provinces and Oudh, the Himalayas, Bengal, Rajputana, Guzerat, Kutch, Concan, Deccan and Mysore; also in Arabia, Beloochistan, Persia, Afghanistan and Eastern Turkistan. Occurs all over Europe and North Africa. Affects the reedy swamps and feeds on aquatic insects, larvæ, snails and grass seeds.

Porzana pygmæa, *Naum. Vog. t.* 239; *Gould. B. Eur.* pl. 344; *Jerd. B. Ind.* iii. p. 722, No. 910; *Murray, Hdbk., Zool., &c., Sind*, p. 224. Porzana Bailloni, *Viell.*—The Pigmy Rail or Baillon's Crake.

Head and hind neck wood brown; back, scapulars and wing-coverts yellowish brown with an olive tinge, the feathers with numerous irregular, white, black-edged spots; supercilium, cheeks, chin and throat grey; breast and upper abdomen bluish grey; the sides, vent and under tail-coverts black, with transverse white bars; primaries dusky brown;

outer web of 1st quill yellowish white; secondaries with zigzag white lines bordered with black; tertiaries yellowish brown, with a tinge of olive, spotted or streaked irregularly with white, which have edgings of black; tail dusky brown; bill dark green; irides reddish; legs fleshy brown.

Length.—7 to 7·75 inches, wing 3·67, tail 1·75 to 2, bill at front 0·62, tarsus 1·0, mid-toe and claw 1·5.

Hab.—Sind, Punjab, N. W. Provinces and Oudh, also Bengal, Nepaul, Rajputana, Kutch, Guzerat, Concan and Deccan, and generally throughout India. It is also an inhabitant of Beloochistan and Afghanistan, and probably Persia also. In Central and Southern India it is said to be not uncommon.

The habits of this species is not unlike the other Rails, but as a rule it is more shy and retiring, and when disturbed, runs with great speed on the lotus leaves or other aquatic herbage, and conceals itself among the thickest of the coverts it frequents.

Porzana minuta, *Pall.*; *Naum. Vog. t.* 239; *Gould. B. Eur.* pl. 345; *Hume, Str. F.* i. 251; *Murray, Hdbk., Zool., &c., Sind*, p. 224. Porzana parvus, *Scop.*—The Little Crake.

Crown of the head deep brown; sides of the head, both above and below the eye, ash or slate colour; chin and throat dull or greyish white, the forepart of the neck pale ash; under parts ashy or grey blue in the males, light rufous buff in females; lower abdomen and vent deep or olive brown, spotted with white; neck behind and shoulder of the wing olive brown; back deep olive brown, the feathers with broad mesial dark stripes, their inner margins pale with some white linear spots and streaks; primaries and secondaries deep brown with paler edges; lesser wing-coverts plain dull olive brown; tail dusky olive brown; under tail-coverts slaty grey with spots and bars of white.

Length.—7 to 8 inches, bill 0·7, wing 3·8, tail 1·5 to 1·75, irides red, bill and legs yellowish green.

Mr. Hume in *Str. F.* i. p. 251, says:—"*Bailloni* (pygmæa) always may be distinguished at a glance from *minuta* by its smaller size, shorter, and in proportion deeper bill, and by having the back, scapulars and greater wing-coverts all more or less profusely variegated with bluish white, whereas in *minuta*, the white markings, which are somewhat broader and purer white, are confined as a rule to the centre of the back, though occasionally some of the longer scapulars are also faintly edged with bluish white. In *minuta* the wing varies from 3·75 to 4·1, the bill at front 0·7 to 0·76; in *Bailloni* (pygmæa) the wing varies from about 3·45 to 3·62, and the bill 0·6 to 0·62.

Hab.—Sind, Eastern Turkistan and Cashmere. Not known to occur anywhere else in India. It is abundant in all the large inland pieces of water or dhunds.

Tribe CULTIROSTRES.—*Cuv.*

Bill large, long, stout and strong, pointed, and in some slightly curved; tarsi generally long and scutellate; tail short; tibia bare for a considerable space.

Family, CICONIDÆ,—Storks.

Bill long and stout, compressed to the tip; nostrils narrow, pierced through the bill and situated near the base of the culmen; tail moderate; front toes united at the base.

Gen. **Leptoptilos**.—*Less.*

Bill very large, high at base, much thickened; keel straight; head and neck more or less naked. Under tail-coverts composed of long, lax, decomposed feathers, known as *marabou*.

Leptoptilos argala, *Lin.*; *Jerd. B. Ind.* iii. p. 730, No. 915; *Str. F.* i. p. 252; *Murray, Hdbk., Zool., &c., Sind*, p. 225. Leptoptilos dubius, *Gm. Pl. Col.* 300. Leptoptilos marabou, *Tem. P. E.* 300.—The Adjutant or Gigantic Stork.

In Breeding Plumage.—Head, neck and gular pouch bare, except a few short scattered hair-like feathers varying in colour from yellowish red to fleshy red; ruff white; back, lesser and median wing-coverts, primaries and secondaries black with a greenish gloss; the greater coverts and tertiaries silvery grey, forming a wing band; under parts white. In non-breeding plumage the white wing band is absent and the black plumage much duller.

Bill pale dirty greenish; irides greyish white.

Length.—60 inches, wing 30, tail 11, bill at front 12 inches, tarsus 11, pouch 16 to 18 inches in length.

Hab.—Sind and throughout the greater part of India; rare in the South, absent in Malabar, where it is replaced by *L. javanicus*; spread throughout North and N. E. India to Burmah and the Malayan Peninsula. In the Deccan, also in Guzerat and Bengal, it is of much service as a scavenger. Its food is very various. Lizards and frogs, and insects too; refuse from dung heaps also does not come amiss to it. From the craw of three specimens collected about 80 miles east of Kurrachee, lizards, (*Uromastix hardwickii*) were extracted. In each an entire animal in four pieces was found which had evidently not been long swallowed. The pieces were very neatly cut; the head making one, the body in two longitudinal halves, and the tail entire, the fourth piece.

Gen. **Xenorhynchus**.—*Bp.*

Bill very large, stout and solid, the tip turned up; 2nd and 3rd quills longest.

Xenorhynchus asiaticus, *Lath.*; *Gr. Ill. Ind. Zool.* pl. Mycteria australis, *Shaw.*; *Jerd. B. Ind.* iii. p. 734; *Murray, Hdbk., Zool., &c., Sind*, p. 225.—The Black-necked Stork.

Head and neck rich dark glossy green, glossed on the hind head with purple; lesser, median and greater coverts and scapulars, also the inter-scapulars and tail dark brown, mixed with rich bluish green with a golden tinge, rest of plumage white; bill black; legs reddish.

Length.—52 to 56 inches, wing 24, tail 9, bill at front 12·5 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Concan, Deccan and the greater part of India, extending to Malayana. In Central and North India it is, as in Sind, extremely common along the banks of rivers and on the edges of tanks and marshes.

Gen. **Ciconia.**—*Lin.*

Keel of bill straight; 3rd and 4th quills longest; hind toe elevated.

Ciconia nigra, *Lin.*; *P. E.* 399; *Gould. B. Eur.* pl. 284; *Jerd. B. Ind.* iii. p. 735; *Str. F.* iv. p. 22; *Murray, Hdbk., Zool., &c., Sind,* p. 225.—The Black Stork.

Head, neck, nape, chin, throat, breast, back and greater and lesser wing-coverts glossy black with blue, green and coppery reflections; primaries black; tail black; under tail-coverts and under parts from below the breast white; legs orange red; nude orbitar area reddish brown; bill blood red; irides dark brown.

Length.—44 inches, wing 24, tail 10, bill at front 8 inches.

Hab.—Sind, Punjab, N. W. and Central Provinces, Oudh, Bengal, Kutch, Concan, the Deccan, Guzerat and Rajputana, also Afghanistan. A winter visitant to India.

Ciconia alba, *Belon.*; *P. E.* 866; *Gould. B. Eur.* pl. 283; *Jerd. B. Ind.* iii. p. 736, No. 919; *Str. F.* iv. 22; *Murray, Hdbk., Zool., &c., Sind,* 225.—The White Stork.

Head, crown, nape, chin, throat, breast and back pure white; greater wing-coverts glossy black, shaded with grey towards the shafts; primaries, secondaries and tertiaries black; nude orbitar area black, legs red; irides brown.

Length.—44 inches, wing 23 to 25, tail 10, bill at front 7·5 to 7·75.

Hab.—Sind, the Deccan, Concan, Rajputana, Kutch, Guzerat and Central India; also the Punjab, N. W. Provinces, Oudh and Bengal. Along the banks of the Indus and the edges of lakes and swamps, in Sind it is not uncommon during winter. Feeds on lizards, molluscs, &c.

Ciconia leucocephala, *Gm.*; *Pl. Enl.* 906; *Jerd. B. Ind.* iii. p. 737, No. 920; *Murray, Hdbk., Zool., &c., Sind,* p. 226. Dissura episcopus, *Bodd.*; *Str. F.* vi. 469.—The White-necked Stork.

Head black; back of neck glossed with purple, also the upper back, breast and upper abdomen; neck white; primaries and upper tail-coverts glossed with green, also the lower back; tail white; irides crimson; eyelids and nude orbitar area plumbeous; throat purplish; bill black, reddish on the anterior half; feet red.

Length.—36 to 37 inches, extent 70, wing 20, tail 7, bill at front 6.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Kutch? Rajputana? Guzerat, Concan, Deccan, South and Central India.

Family, ARDEIDÆ,—Herons.

All the members of the *Ardeidæ* family swarm in the Province in suitable localities. All are permanent residents and breed from May to September. Their nests are generally loose structures, some more or less compact, and built of twigs, &c. on trees, standing in the vicinity of water, and particularly on those in the middle of large sheets of water. Eggs, 3 to 4, glossless, and in colour from pale sea green to bluish green, but it is not uncommon to find single nests containing from 8 to 10 eggs, differing in shape, size and colour.

The following, from Hume's *Nest and Eggs*, gives the average size of the eggs of the different species:—

Ardea cinerea	2·27 × 1·66
Ardea purpurea	2·17 × 1·56
Herodias alba	2·11 × 1·55
Herodias garzetta	1·73 × 1·22
Demiegretta gularis	1· 7 × 1· 3
Bubulcus coromanda	1·71 × 1·32
Ardeola grayi	1·48 × 1·17
Butorides javanica	1·64 × 1·23

An account by Layard of the breeding of *Herodias garzetta* and kindred species in Ceylon, conveys exactly what is observable in the breeding season of the *Ardeidæ*, along the canals, &c., in the Narra Districts, and other large sheets of water in Sind.

During this season almost all the large pieces of water in Sind, unfrequented and distant from human habitation, in which trees are standing out of reach, except by boats, large colonies of ibises, spoonbills, cormorants, snake-birds, night-herons, &c., may be seen. During the day, except by the droppings of the birds, which coat the branches so thickly with lime, little suspicion would be excited of the spot being a heronry, as most of the birds, except a few sitting close, are away feeding, but towards eve, hundreds would be seen coming to roost, amid a continuous cackling. The report of a gun amongst them would present a scene scarcely describable. If disturbed before they have begun to lay, they entirely desert the spot, and carry away almost every stick they have used in building and begin operations afresh in a distant locality.

Gen. **Ardea**.—*Linn.*

Bill slender, the tip scooped; upper mandible with a groove from the nostril, but not extending to the tip; nostril covered partially by membrane; 2nd and 3rd quills longest; tarsi long and scutellate in front.

Ardea cinerea, *Linn.*; *P. E.* 755, 787; *Naum. Vog.* t. 220; *Gould. B. Eur.* pl. 274; *Jerd. B. Ind.* iii. p. 741; *Murray, Hdbk., Zool., &c., Sind*, p. 226 (*Saah.* Sind).—THE BLUE HERON.

Forehead, sides of the head and crown white; a narrow streak from the base of the upper mandible over each eye, and another above it merging into the long occipital feathers, black; neck behind bluish ashy; in front white, with two rows of black elongate spots; breast and under surface white; back and wing-coverts bluish ashy grey; primaries black; scapulars silvery grey; tail bluish ashy; bill dark yellow, brown on the upper mandible; irides yellow; nude orbitar area greenish.

Length.—39 inches, wing 18, tail 8, bill at front 5.

Hab.—Throughout India and Europe. In Sind the Mohannas or fishermen use this species as a decoy in the capture of wild fowl. Each boat has usually from 5 to 10 birds. Their eyelids are sewn up, and they stand motionless on the cross bar of the rudder gear or perched along the edges of the boat. They are fed daily, and during summer, when the occupation of wild fowl catching has ceased, serve the fishermen as food in the absence of any thing better.

Ardea purpurea, *Linn.*; *P. E.* 788; *Naum. Vogt. t.* 221; *Gould. B. Eur.* pl. 274; *Jerd. B. Ind.* iii. p. 743; *Murray, Hdbk., Zool., &c., Sind*, p. 226—THE PURPLE HERON.

Head glossy black, with a lengthened black crest, the two middle feathers of which extend 3—4 inches beyond the rest; sides of the head rusty yellow, with three longitudinal narrow black lines, one extends behind the head, and is continued down the neck, and two lateral ones from the eyes to the breast; chin and throat white; neck in front variegated with rufous black and purple, the feathers on the top of the breast long and acuminated, purplish white; back, wings, and tail reddish ash; scapulars purple, long, forming a brilliant plume on each side; breast and flanks deep brownish red, rest of under parts a little paler; bill deep yellow: orbitar skin greenish yellow; tarsus reddish brown.

Length.—36 to 42 inches, wing 15·5, tail 5·75, bill at front 5·37, tarsus 5·25.

Hab.—Throughout India and Ceylon, extending into Burmah.

Gen. **Herodias**.—*Boie.*

Bill moderately long, slender, straight and compressed to the tip; plumage white. In breeding plumage with a long dorsal train composed of lax decomposed feathers, and pectoral plumes in some. The following is a key given by Mr. Hume of the Indian species of the genus:—

Species.	Non-breeding plumage.	Breeding plumage.				Dimensions.				
	Bill.	Bill.	Crest.	Dorsal train.	Pectoral plumes.	Bill at front.	Wing.	Tarsus.	Nude portion of tibia.	Mid-toe and claw.
H. alba, *Linn.*	Yellow.	Black...	None	Long; extending 5 inches beyond tail.	None	5·0	17·2	7·91	5·2	4·7
H. torra, *B. Ham, Jerd. B. Ind.* iii. 744.	Yellow.	Black...	None	Long; extending 4 inches beyond tail.	None	3·72 to 4·6	13·2 to 15·2	5·25 to 7·0	3·3 to 4·8	3·71 to 4·5
H. intermedia, *V. Haselt. Jerd. B. Ind.* iii. 745.	Yellow.	Black...	None	Long; about 7-8 inches beyond tail.	Of long decomposed feathers.	2·68 to 3·09	11·15 to 12·65	4·1 to 4·6	2·8 to 3·1	3·62 to 4·05
H. garzetta, *Linn. Jerd. B. Ind.* iii. 746.	Black...	Black...	Of 2 narrow feathers 5-6 inches long.	Long; curling up at point scarcely extending beyond the tail.	Of long, narrow, ordinary feathers.	3·1 to 3·6	9·8 to 11·4	3·7 to 4·6	1·8 to 2·75	2·75 to 3·15

Hab.—Throughout India.

Gen. **Demi-egretta.**—*Blyth.*

Bill long and more slender than in *Herodias*; adult plumage dark, otherwise as in *Herodias*.

Demi-egretta gularis, *Bosc. Act. Soc. H. N.* i. t. 2; *Meyer, Zool. Ann.* i. t. 1.; *Hume, Str. F.* i. 254. Demi-egretta schistacea, *Licht.*; *Hemp.* and *Ehr. Sym. Phys.* t. 6. Demi-egretta asha, *Sykes, Cat.* 171; *Jerd. B. Ind.* iii. p. 747, No. 928; *Murray, Hdbk., Zool., &c., Sind*, p. 227.—The Ashy Egret.

Adult.—In breeding season, deep slaty blue; chin, throat, sides of the head, nearly to the gape and the bases of the ear-coverts white; an occipital crest and dorsal train of decomposed feathers, concolorous with the upper parts, and not reaching quite to the end of the tail; pectoral plumes narrow and pointed; bill reddish yellow, dusky above; nude orbitar skin yellowish green; legs blackish; feet and lower part of tarsus yellowish.

Length.—24 to 27 inches, wing 10 to 11·4, tail 3 to 3·8; irides yellow; bare portion of tibia 2·2 to 2·9, bill 3·5 to 4·1, tarsus 3·9 to 4·4, mid-toe and claw 2·3 to 2·6. Affects the mud flats in the Kurrachee harbour.

The young or intermediate stage of plumage is white throughout, some of the wing-coverts being greyish.

Hab.—Sind, Mekran, Arabian and Western Coasts.

Bubulcus.—*Pucher.*

Bill shorter than in the Egrets; legs longer; plumes during the breeding season yellow.

Bubulcus coromanda, *Bodd.*; *P. E.* 910; *Jerd. B. Ind.* iii. 749; *Murray, Hdbk., Zool., &c., Sind*, p. 229. Ardea russata, *Tem.* Ardea affinis, *Horsfield.*—The Buff-backed Heron or Cattle Egret.

In breeding plumage, the head, sides of the face, neck in front (except a narrow mesial line, which is white) nape and part of the hind neck, and the decomposed elongate feathers brilliant orange, the filamentose feathers of the back reach to the end of the closed wings, rest of the plumage pure white; legs yellowish green, the joints tinged plumbeous; bill deep orange yellow; orbitar skin yellowish, with a pinkish tinge; irides pale yellow; mid-claw serrated.

Length.—21 inches, wing 10·25, tail 4, bill at front 2·5, tarsus 3·5. In winter the plumage is entirely white.

Hab.—Sind and throughout India, Burmah and Ceylon. It has gained the name of the Cattle Egret from its always being found amongst cattle when grazing, usually perched on their heads or backs. It is seldom like the other species, seen wading in water. Feeds chiefly on insects, small frogs or tadpoles.

Gen. **Ardeola**.—*Boie.*

Tibia feathered nearly to the knee; tarsus shorter than in *Bubulcus*; toes also shorter.

Ardeola grayii, *Sykes*; *Gray, Ill. Ind. Zool.* pl. 48. Ardeola leucoptera, *Bodd.*; *P. E.* 911; *Jerd. B. Ind.* iii. 751; *Murray, Hdbk., Zool., &c., Sind*, p. 226.—The Pond Heron or Paddy Bird.

In summer dress the head is greyish or buffy yellow with an elongate white crest; neck in front, except a fulvous mesial line, back of the neck, and also breast, with the elongated feathers a little paler than the head; scapular pale greyish brown, elongated dorsal feathers dark maroon, rest of the plumage white; tarsal plumes fulvous or pale buff; bill yellowish, bluish at the base and tipped black; orbitar skin greenish yellow; irides bright yellow; legs and feet dull greenish.

In winter the crown of the head and nape are dark brown, the feathers with narrow mesial shaft-streaks; neck behind, on the sides and breast fulvous or pale buff, the feathers edged with dusky brown; back and scapulars grey brown or pale ashy brown; lower back, rump, upper and under tail-coverts, also the tail and abdomen pure white; thigh-coverts fulvous; primaries white, dark shafted, the outer webs of the first three quills and also their tips greyish brown; secondaries pure white; wing-coverts white, tinged very slightly in some specimens with greyish.

Length.—18 to 19 inches, wing 8 to 8·5, tail 3, bill at front 2·5.

Hab.—Sind and throughout India. Abundant in all moist localities, at the edges of ponds, ditches, marshes and lakes, and especially in rice fields.

Gen. **Butorides**.—*Blyth.*

Bill moderately long and stout; tibia feathered nearly to the knee; inner toe short; head crested.

Butorides javanica, *Horsf.*; *Jerd. B. Ind.* iii. p. 752; *Str. F.* i. 256; ii. 310; iii. 191; *Murray, Hdbk., Zool., &c., Sind*, p. 226.—The Little Green Heron.

Forehead and crown glossy black, also the long occiptal crest; a streak from behind the eye including the ear-coverts white, in some with a fulvescent tinge; another streak, which is black, below the eye; back and sides of the neck, also the breast and abdomen greyish brown, ashy brown in some; chin and a streak down the front of the neck white; back and scapulars green, the feathers lengthened, lanceolate and white shafted; the tertials white edged; wing-coverts glossy green, edged with pale buff or fulvous; secondaries margined round their tips with yellowish white; tail dark slaty; under tail-coverts greyish; quills dark slaty, narrowly tipped with white; bill black above, pale yellow beneath; legs yellowish green.

Length.—16 to 16·75 inches, wing 6·75, tail 2·5, bare part of tibia 0·5; irides bright yellow; nude orbitar skin dull green.

The young bird—or bird of the year—is very differently marked. The head is black, with the feathers narrowly striated mesially with rufescent; sides of the neck and breast and lower parts fulvescent white, the feathers edged with dark brown; chin, throat and a line down the neck white; back and scapulars brown with a greenish tinge; the scapulars with a minute triangular white spot at the tip. Primaries and secondaries dusky brown, each with a triangular white, or fulvous white spot at the tip; primary coverts the same; wing-coverts brown, broadly edged with rufescent, each feather with a rufescent or white triangular spot at the tip; edge of the wing fulvescent white.

Hab.—Sind and throughout the greater part of India, extending to Ceylon and Burmah.

Gen. **Ardetta**.—*Gray.*

Bill rather slender and straight; toes and claws long; tarsus short, otherwise as in *Butorides*. Habit nocturnal.

Ardetta flavicollis, *Lath.*; *Gray, Ill. Ind. Zool.* pl. 66,2; *Jerd. B. Ind.* iii. p. 753; *Murray, Hdbk., Zool., &c., Sind*, p. 228. Ardea nigra, *Viell.*; *Jerd. Ill. Ind. Orn.* p. 16.—The Black Bittern.

"In the breeding season the plumage is dull cinereous black; chin and throat with the feathers tipped white, or with red brown; the larger feathers of the neck are mixed with white, red brown and dusky black, each feather having some black at the base and tip, and more or less red brown on one web only; a stripe of golden yellow down the side of the neck, widening inferiorly; feathers of the back forming the dorsal plume, lengthened, but not decomposed; the feathers of the breast dark ashy, slightly lengthened; abdomen dusky, mixed with whitish; inner wing-coverts dusky reddish. The young bird has the feathers slightly edged with rufous, and the throat and neck less richly coloured than in the adult; bill livid red, dusky on the culmen; cere livid purple; irides yellow, in some with an outer circle of red; legs pale brown with a tinge of green in some, reddish brown in others."

Length.—23 to 24 inches, wing 8·5, tail 3, bill at front 3·5, tarsus 2·5.—*Jerdon.*

Hab.—Sind, Punjab, N. W. Provinces, Deccan, Concan, and nearly throughout India, extending to Ceylon and Burmah. Affecting swamps, rice fields and beds of rushes and reeds. Breeds in Sind. Mr. Doig obtained the eggs of a colony of these birds in the month of May on the Narra Canal. He says—"Once the sun is well up, they are seldom seen, unless actually beaten out of the dense tamarisk and reed jungle in which they lie hid." They are nocturnal feeders; the nests are formed of tamarisk twigs, with sometimes a few aquatic weeds on which the eggs are laid; always four in number, broad ovals, sharp at both ends, and nearly white in colour; size from 1·5 to 1·85 × 1·15 to 1·30 inches.

Ardetta cinnamomea, *Gm.; Gray, Ill. Ind. Zool.* pl. 66. i.; *Jerd. B. Ind.* iii. p. 755; *Str. F.* ii. 311; vi. 483; *Murray, Hdbk., Zool., &c., Sind,* p. 228.—The Chestnut Bittern.

Top of head, back and scapulars chestnut, the feathers centred slightly darker; chin and throat white, with a median chestnut line; foreneck and breast chestnut, the feathers slightly darker mesially, and the edges of those on the breast fulvous; a median fulvous line on the foreneck; thigh-coverts also chestnut; primaries, secondaries and tail dark brown; wing-coverts like the back, but more fulvous; flanks buffy, the feathers mesially streaked with dusky; abdomen, vent and under tail-coverts white with a fulvous tinge in some; bill yellow, dusky superiorly; orbitar skin yellow; irides yellow; legs yellowish with a greenish tinge.

Length.—15 to 16 inches, wing 6, tail 1·75, bill at front 1·8 to 2, tarsus 1·9 to 2.

In immature plumage the upper parts, wing-coverts, scapulars, neck in front and breast, also the thigh-coverts are reddish brown, or slightly darker, the feathers of the back and breast margined from ferruginous buff to fulvous.

Hab.—Sind, and nearly throughout India.

Ardetta sinensis, *Gmelin; Hardwick, Ill. Ind. Zool.* pl.; *Jerd. B. Ind.* iii. p. 755, No. 934; *Str. F.* i. 308; ii. 311; *Murray, Hdbk., Zool., &c., Sind,* p. 229.—The Yellow Bittern.

Top of head cinnamon rufous, the feathers centred broadly with black, giving it quite a black appearance; neck behind, back, scapulars, tertiaries and wing-coverts deep cinnamon-rufous, the feathers margined with fulvous or bright buff; primaries and secondaries, greater wing-coverts and tail black; edge of wing and under wing-coverts fulvous white; chin and throat white, with a median buff line; sides of the breast deep brown, margined with buff; breast bright buff, margined paler; abdomen, vent, and under tail-coverts buffy white; legs yellowish green; bill pale yellow, brownish superiorly.

Length.—13 inches, wing 5·25, tail 1·75, bill at front 2, tarsus 1·7 to 1·8, mid-toe 1 inch.

Hab.—Sind, Bengal, Kutch, Deccan and nearly throughout India, though less common than the last, and frequenting similar situations, *i.e.*, high reed and thickets. All the species are nocturnal feeders, and remain hid during the day in dense cover.

Ardetta minuta, *Linn.; Pl. E.* 323; *Naum. Vogt.* t. 227; *Gould. B. Eur.* pl. 282; *Jerd. B. Ind.* iii. p. 756, No. 935; *Murray, Hdbk., Zool., &c., Sind,* p. 228.—The Little Bittern.

Top of the head, back, scapulars and tail black, with greenish reflections; hind-neck nearly bare of feathers, those of the foreneck falling back and covering it; cheeks, chin, neck and all the lower parts of the body reddish buff or inclining to chestnut; the feathers on the sides of the breast are black, edged with buff; those of the flanks long, and narrowly striped mesially with pale brown;

primaries and secondaries black or greyish black; greater and lesser wing-coverts dull yellowish buff; bill bright yellow, dusky above; orbitar skin and irides yellow; feet greenish with a yellow tinge.

Length.—15 inches, wing 5·75, tail 2, bill at front 1·75.

Hab.—Sind, Bengal, Punjab, Beloochistan, Persia and the Himalayas are the only known localities where this species has been found outside of Europe, Persia, Syria and Arabia. It breeds in the Narra Districts in Sind, where Mr. S. Doig took its eggs.—(*Str. F.* viii. 372, 379.) Each nest contained 4—6 eggs, elongate ovals, and pure white, with a very slight tinge of sea green not perceptible in the blown egg.

Gen. **Botaurus**.—*Briss.*

Bill rather short, stout and rounded; tip scooped; the upper mandible curved to the tip, and longer than the lower; tarsi short; nostrils narrow, situated near the base of the bill; 1st to 3rd quills of wing longest.

Botaurus stellaris, *Linn.*; *Pl. E.* 789; *Naum. Vogt.* t. 226; *Gould. B. Eur.* pl. 280; *Jerd. B. Ind.* iii. p. 757, No. 936; *Str. F.* i. 256; iv. 24; vii. 526; *Murray, Hdbk., Zool., &c., Sind,* p. 228.—The Bittern.

Forehead, crown and nape glossy black, also a moustachial stripe; sides of the face and ear-coverts buff, with narrow dusky streaks; feathers of the sides of the neck long and lax, bright buff, and with irregular black transverse bars; hind neck bare, covered by the feathers of the foreneck; chin and throat fulvous, with a median rufescent line; foreneck and breast the same, each feather with irregular dark brown, nearly black bars and spots; lower breast with long, lax feathers, which are buff, with broad longitudinal black stripes; flanks the same; abdomen rufous buff, with narrow dark mesial streaks; back and scapulars black, the feathers edged, barred and mottled with buff; tail buff, thickly mottled and with zigzag markings of dusky; primaries and secondaries dark brown, barred with rufous; wing-coverts buff, barred and mottled with dusky brown; bill pale yellow, dusky above; orbits yellow; irides gamboge yellow; legs greenish yellow.

Length.—30 inches, wing 13·5, tail 4·5, tarsus 3·75 to 3·9.

Hab.—Sind, the Deccan, Punjab, N. W. Provinces, Oudh, Bengal, and nearly all India; Central and Southern Europe, Persia, Nubia, Beloochistan and S. Afghanistan.

The Bittern is a shy solitary bird; it is never seen on the wing during the day, but sits hid among the reeds, rushes and other rank vegetation that prevail in the marsh, &c., where it has taken up its abode. It is said to defend itself fiercely against a dog or falcon, with both its bill and claws, the bill with its extremely sharp point being however chiefly made use of. It is said to have been esteemed in falconry, owing to its habit, when flown at, to rise high up in the air, ascending in spiral circles, to keep above its enemy. Selby adds—"Should this manœuvre fail, it then prepares for the descent of the hawk, by setting its sharp bill perpendicularly upwards, upon which its antagonist frequently transfixes itself." Its boom or note is said to

resemble the bellowing of a bull. It is heard while the bird is soaring in the air, but the sound is feeble, compared with the hollow booming noise which it makes at night during the breeding season.

Gen. **Nycticorax**.—*Steph.*

Bill long, sharp, the gape extending below the eyes; nostrils in a lateral groove covered by membranous scale; wings with the 2nd and 3rd quills longest; claw of mid-toe serrated; tarsi irregularly scaled.

Nycticorax griseus, *Linn.*; *P. E.* 758,759; *Naum. Vogt.* t. 225; *Gould. B. Eur.* pl. 279; *Jerd. B. Ind.* iii. 758, No. 937; *Str. F.* iv. 415; *Murray, Hdbk., Zool., &c., Sind*, p. 228. (*Gadri*, Sind).—The Night Heron.

Forehead and supercilium, also the chin, throat and a narrow mesial line on the foreneck white; under tail-coverts, breast and abdomen white, with a creamy tinge; top of head and nape, also the back and scapulars black, glossed with green; lengthened crest feathers 6—7 inches long, narrow and white, tipped with brown; hind-neck, wing-coverts, tail and sides of the body ash grey; first three quills emarginate near the tip; bill black, yellow at base of lower mandible; orbitar skin yellowish green; irides blood red.

Length.—22—23 inches, wing 12·5, tail 3·75, bill at front 2·8, tarsus 3.

Hab.—Sind, Beloochistan, Persia, Afghanistan and throughout India. It is a permanent resident in the Province, and breeds from May to September in societies. The nest is a loose structure of twigs. Eggs 3—4, glossless pale sea-green; 1·92 × 1·35.

Family, TANTALIDÆ.

Bill long, stout, rounded, curving downwards in many, flat in others; wings long; tail rather short; toes webbed at the base.

Sub-Family, TANTALINÆ.

Bill long, slender and curved, sides compressed to the tip, or thick and rounded; tail even; inner toe shorter than outer; hind toe long.

Gen. **Tantalus**.—*Linn.*

Bill rounded, long and curved downwards; nostrils at the base of the bill; head and cheeks bare; tibia naked for half its length.

Tantalus leucocephala, *Gm.*; *Forst. Ind. Zool.* pl. 20; *Gould. B. Asia.* pl. 5; *Jerd. B. Ind.* p. 761, No. 938; *Str F.* vii. 309, 507. Tantalus gangeticus, *Shaw, Nat. Misc.* pl. 223; *Penn. Ind. Zool.* pl. 11. (*Lungduk*, Sind.)—The Pelican Ibis.

Plumage white; quills and tail richly glossed greenish black; tertiaries white, tinged with rosy, with a dark band near the end and a white tip, the feathers lax and decomposed; lesser and median-coverts glossy green, edged with white; greater coverts white; bill yellow, the tip greenish, as are the naked orbits, head and gular skin; irides pale yellow brown, grey in some; legs fleshy red.

Length.—40—42 inches, expanse 71, wing 20, tail 6·25, tarsus 8·10.

Hab.—Sind and throughout India; frequenting rivers, tanks, marshes, &c. Breeds in the Province from May to August. Eggs 3—4, glossless, dull white, with a thick compact shell.

Sub-Family PLATALEINÆ,—Spoonbills.

Bill flat, spathulate, long and rounded at the tip.

Gen. Platalea.—*Lin.*

Bill thin, flat, dilated and rounded at the tip (spathulate) otherwise as in *Tantalus*; toes connected by a small membrane extending as far as the second joint of the outer and the first joint of the inner one.

Platalea leucorodia, *Lin.*; *P. E.* 405; *Gould. B. Eur.* pl. 286; *Jerd. B. Ind.* iii. p. 763; *Murray, Hdbk., Zool., &c., Sind.* p. 229.—The Spoonbill.

Plumage pure white, except a buffy yellow patch on the upper breast, extending sometimes on to the back; orbitar skin orange yellow, also the skin of the gullet; head crested; bill black, spotted or barred with yellowish; the tip yellowish during winter; irides blood red; legs black.

Length.—31 to 36 inches, wing 14 to 16, tail 6·25 to 6·5, bill at front 7 to 8·5.

Young.—With the shafts and tips of primaries black.

Hab.—Sind, Beloochistan, Persia, Afghanistan and throughout India, frequenting rivers, lakes, &c.

Sub-Family ANASTOMINÆ.

Bill thick, stout, gaping in the middle.

Gen. Anastomous.—*Illiger.*

Bill long, curved, thick, solid, gaping in the middle, compressed at the sides; tail nearly even; nostrils basal, at the edge of the upper mandible; tarsi reticulated; tibia naked for half its length; toes webbed at the base.

Anastomous oscitans, *Bodd.*; *P. E.* 932; *Jerd. B. Ind.* iii. p. 765, No. 940; *Str. F.* iv. 212; *Murray, Hdbk., Zool., &c., Sind*, p. 229.—The Shell Ibis.

Young.—Plumage light grey, darker on the head and neck, the feathers on the latter hair-like; upper back, scapulars, primaries and secondaries, also the winglet and tail black, with purple reflections; nude skin of the chin and front of the eyes greenish black; in a later stage of plumage the head, sides of the face, nape and neck behind are dusky brown, the feathers short; neck in front, breast, lower parts, back, wing-coverts and tail pure white, the primaries and secondaries, also; their shafts black, also the shafts of the winglet; the first three primaries broadly margined with black on their outer and inner webs, their tips black; the inner webs of the primaries margined only to

the notch; tertials white, also black-shafted; the upper series slaty grey, with their webs lax and disunited. In the breeding plumage the bird is entirely white; bill greenish black; nude orbitar and gular skin blackish; irides grey or pale brown; legs blackish.

Length.—29—30 inches, extent 50, wings 15—16 inches, tail 7, bill at front 6·5 to 8, tarsus 5·25 to 5·5.

Hab.—Sind, Beloochistan, Persia, Punjab, N. W. Provinces, Oudh, Bengal, Guzerat and the Deccan; abundant in Bengal and Central India, chiefly found in the vicinity of rivers, lakes and marshes; resident in Sind. Breeds from July to September in company with *Threskiornis melanocephalus*.

Sub-Family, IBIDINÆ.

Bill more slender, long and curved, as in *Anastomatinæ*.

Threskiornis, *Gray*.—Bill nearly square at base, curved; upper mandible with a lateral groove extending to the tip; nostrils situated at its base; tail short; hind toe half as long as the mid-toe; head and neck nude; scapulars and tertials lengthened and decomposed; feathers of the breast elongated; plumage white.

Threskiornis melanocephalus, *Lath.*, *Jurd. and Selby, Ind. Orn.* pl.; *Tem. Pl. Col.* 481; *Jerd. B. Ind.* iii. p. 769; *Murray, Hdbk., Zool., &c., Sind*, p. 229.—The White Ibis.

Head and neck nude; lower neck, back, wings and their coverts, primaries, secondaries, entire under surface from the breast and also the tail, white; scapulars and tertials lengthened, their outer webs disunited, and of a greyish colour. In another stage of plumage the quills are black with green reflections; bill and legs black; irides blood red.

Length.—29—30 inches, wing 14, tail 5·75, bill at front 6, tarsus 4·

Hab.—Sind, Mekran Coast, Persia, Rajputana, Kutch, Guzerat, Concan, Deccan, and nearly throughout India. A resident in Sind; breeds from July to September. Eggs 4—6, white or dingy white, with a slight bluish tinge when fresh, size 2·5 × 1·75.

Gen. Geronticus.

Bill more slender and longer than in *Ibidinæ*; plumage black.

Geronticus papillosus, *Tem. Pl. Col.* 304; *Jerd. B. Ind.* iii. p. 769; *Murray, Hdbk., Zool., &c., Sind*, p. 229.—The Warty-headed Ibis.

Head, nape, chin and throat nude, black; crown with a triangular patch of bright red papillæ, extending in front in line with the eyes, and behind to the back of the head; neck and entire under-surface fuscous brown, unglossed; back, scapulars and tertials the same, but glossed with purplish; upper tail-coverts dark brown, slightly glossed with steel blue; under tail-coverts glossed with bluish; wings glossy steel blue, mixed with purple; a large patch of white on the

wing above the shoulder, formed by the white of the innermost lesser wing-coverts; bill plumbeous with a greenish tinge; irides orange red; legs and feet brick red.

Length.—30 inches, wing 15, tail 7·5, bill 6 to 7, tarsus 3.

Hab.—Sind, Beloochistan, Persia, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Central India, Khandeish, Guzerat, Concan and Deccan. Occurs on the Western Coast generally. A resident in Sind; breeds from July to September.

Gen. **Falcinellus**. *Bech.*

Bill long and slender, more so than in *Threskiornis;* tarsus longer; 2nd and 3rd quills longest.

Falcinellus igneus. The Glossy Ibis.

Falcinellus igneus, *Linn.; P. E.* 819; *Desc. del'Egypte*, t. 7, 2; *Gould. B. Eur.* pl. 311; *Jerd. B. Ind.* iii. p. 771, No. 943; *Str. F.* i. 257; *Murray, Hdbk., Zool., &c., Sind*, p. 230.—The Glossy Ibis.

Head, on the crown and sides deep greenish dark brown, glossed with metallic purple, the feathers lanceolate; neck, nape, chin and throat, also the back and breast deep rich reddish brown or chestnut red; lower back, rump, wing-coverts and tail dark green, with bronze and purple reflections; primaries dark brownish black, tinged with green; tertiaries dark red brown; legs blackish green, with a blue garter above the knee; claw of mid-toe scooped or hollow below, and forming a sharp edge on one side; irides brown; lores nude.

Length.—22—23 inches, wing 10·5 to 11, bill at front 6 to 6·5, tarsus 4·5. Birds of the year are dark brown, the feathers of the head, chin

and throat margined with white or lineated; back greenish brown, very little glossed; under parts dusky.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Central India, Guzerat and the Deccan. It is not known from the Concan, but possibly occurs there, being a bird essentially affecting paddy fields, marshes and jheels. Breeds in Sind.

ORDER.—NATATORES.

Feet more or less fully webbed; tarsi compressed, generally short, except in the *Phœnicopteridæ;* bill various; wings also variously developed. The first tribe of the order is *Lamellirostres*, or birds with thick depressed bills, usually covered with soft skin, the tip commonly called the "nail," above being horny; the edges of the bill are serrated, forming lamellar teeth, which serve as a sieve.

Family, PHŒNICOPTERIDÆ.

Bill thick, rounded, rather compressed on the sides, suddenly bent downwards in the middle; tarsi and thighs long, the latter naked; tarsi scutellate.

Gen. **Phœnicopterus**,—*Linn.*

Margin of bill lamellate and dentate; nostrils in a groove covered by membrane; neck very long; 1st and 2nd quills of wing longest; other characters as in the Family.

Phœnicopterus antiquorum, *Tem.; P. E.* 63; *Naum. Vogt.* t. 233; *Gould. B. Eur.* pl. 287. Phœnicopterus roseus, *Pall.; Jerd. B. Ind.* iii. p. 775, No. 944; *Hume, Str. F.* i. p. 257; *Murray, Hdbk., Zool., &c., Sind*, p. 230.—THE FLAMINGO.

Plumage throughout of a rosy white in the adult bird; primaries and secondaries black; primary and greater wing-coverts white, dark shafted and broadly tipped with black; rest of the wing-coverts and tertiaries rosy red; axillaries and under wing-coverts rosy red; bill rosy, broadly black at the tip; legs and feet rosy red.

Length.—48 to 54 inches, wing 16 to 16·5, tail 6, bill 4 to 4·12. Birds of the year have scarcely any rosy tinge, and the plumage, especially of the upper parts, is mixed with dusky.

Hab.—Beloochistan, Persia, Afghanistan, Punjab, N. W. Provinces, Oudh, Bengal, Central India, Rajputana, Kutch, Guzerat, Concan, Deccan, South India and Ceylon. Every where in flocks of thousands on all the lakes, rivers, &c., especially in Sind. Mr. Hume (*Str. F.* i. p. 257) truly describes them "as occuring in countless myriads, seen either massed upon the water, as huge rosy islands, or floating above it like a sunset cloud in all the larger lakes of Sind. On taking flight, the exposure of the rosy upper and under wing-coverts turns the mass into a gigantic brilliant rosy scarf, waving to and fro in mighty

folds as it floats away." They are also common about the Kurrachee harbour, chiefly on the mud flats and in Clifton Bay; usually they are in large parties drawn up in line. When feeding they have their necks and heads bent down in such a position, that the upper mandible rests on the ground; with it they stir up the limpid ooze in search of animalculæ, minute crustacea, fish, &c., on which they live. Like the Cranes the Flamingoes also have sentinels posted to give warning of danger; their flesh is not considered good, but the Mohannas or fishermen caste on the Indus consider it palatable, the fishy taste being lost on their palates, owing to their principal diet being fish. The ancients considered it choice food, and the Egyptians, at the present day, are partial to the flesh. From the tongue they are said to extract an oil which they use for flavouring certain viands.

They have been found breeding at Fao in Mesopotamia; the nest is as curious as the structure of the bird, being a truncated cone, built entirely of stiff clayey mud, on which the parent bird sits either astride or with its long legs folded under it; eggs 2 in number, white, and very chalky.

Phœnicopterus minor, *Geoff. St. Hil.*; *P. C.* 419; *Schleg. De. Dier.* fig. 279; *Ibis.* 1869, pl. 15, 8; *Hume, Str. F.* i. p. 31; ii. 339; *Murray, Hdbk., Zool., &c., Sind*, p. 230.—The Lesser Flamingo.

"In winter plumage the head, neck and the whole body above and below is a delicate pale rose colour; on the back little more than white, tinged with rosy; the scapulars are almost white, with a pale rosy streak down the centre; the quills are black, except the tertials, which are like the scapulars, but slightly pinker; the wing-coverts are pale rosy white, the lesser and median broadly centred at the tip with a bright rather pale cerise, and the legs and feet are a bright rose pink. In the breeding season the rosy tint is very much brighter, the throat is *bright* rose colour, each of the feathers of the breast is broadly centred towards the tip with bright cerise; the feathers of the upper portion of the back are many of them similarly centred, and over the broad rosy white scapulars a number of comparatively narrow, elongated, intensely cherry-coloured plumes (which reach as far down as the end of the closed wing) have been thrown out; the whole visible portion of the secondary, lesser and median-coverts have become the most brilliant cherry colour with only narrow white tips; and the lower tail-coverts, flanks and vent feathers are bright rosy, tinged with cherry colour, with only narrow white tips; the legs and feet too have become a deep but brilliant red; as for the bill, the basal portion is a deep vinous red, the tip black, and the intermediate portion bright crimson lake."

Length.—33 to 35 inches, wing 12·5 to 13·75, bill from gape 3·5 to 3·6, tail 4·5 to 4·75, tarsus 7·5 to 8·5.—(*Hume, Str. F.* 1. 33-34).

Hab.—Sind, Persia, Punjab, N. W. Provinces, Rajputana, Guzerat and the Deccan.

Gray, in his *Handlist of Birds in the Br. Mus.*, gives W. Africa, Cape of Good Hope and the Coast of the Red Sea as its other habitats. Occurs associated with *P. antiquorum*.

Family, CYGNIDÆ.—*Bp.*

Neck very long; legs moderate; front toes broadly webbed; hind toe not lobed; keel long; bill high at the base, with a fleshy or callous tubercle; cere extending to the eye; 2nd and 3rd quills of wing longest; tail short, rounded.

Cygnus olor. The Mute Swan.

Cygnus olor, *Gm.*; *P. E.* 913; *Naum. Vogt.* t. 29; *Gould. B. Eur.* pl. 354; *Str. F.* vii. pp. 99,101,106; *Murray, Hdbk., Zool., &c., Sind*, p. 231.—THE MUTE SWAN.

Entire plumage white; callous tubercle at base of upper mandible; legs, feet and cere black; bill reddish orange, the edges and tip black; irides dark brown.

Length.—48 to 52 inches. The following are the measurements of the three specimens obtained by Mr. H. E. Watson given in Mr. Blanford's paper on Wild Swans in Sind.—(*Str. F.* vii. 101.)

	No. 1.	No. 2.	No. 3.
Length from tip of bill to end of tail...	58· 5″	62·″	60·″
Expanse	78·	84·	82·
Closed wing	22·	23·	.....
Tail from vent	9·75	10·25	9·75
Bill from gape	3·75	3· 8	.....
Tarsus measured on inner side.....	3· 8	4· 2	.....

The female resembles the male in every particular, except that the callous tubercle is smaller.

This species was obtained on the Munchur Lake during an unusually severe winter in Sind by Mr. H. E. Watson, Deputy Collector of Sehwan, shortly after I left the Lake in the same year (1878). In every instance, where the species has occurred, it was during an unusually severe winter. Mr. Hume, in his *Game Birds*, says—"It may be considered a pretty regular, though somewhat rare, cold weather visitant to the Peshawar and Hazara Districts, and an occasional straggler to the Kohat and Rawul Pindee Districts, and to the Trans Indus portions of Sind."

It has occurred near Peshawar in 1857. In 1871, Captain Unwin obtained a specimen in the Rawul Pindee District. Dr. Stolickza in *J. A. S. B.* 1872, p. 229, says—"While crossing the Runn of Cutch he noticed several swans, but at too great a distance for it to be possible to form an idea as to the species the birds belonged to," "and from its occurrence in Sind," Mr. Hume says "renders it not improbable that Dr. Stolickza was right."

Outside our limits this species has been seen in the Kabul river, near Jellalabad, and is known to visit Northern Afghanistan pretty regularly. Breeds in Western Turkistan.

Family, ANSERIDÆ.

Bill moderate, narrower in front than behind; keel elevated at the base, sloping to the tip; nail at point of bill horny and hard; legs moderate; knee bare; hind toe partially lobed; laminar teeth present.

Sub-Family, ANSERINÆ.

Characters same as those of the Family.

Gen. Anser.—*Briss.*

Bill high at the base, rather long; lamina at edge wide and visible externally; nostrils in the nude cere, longitudinal.

Anser cinereus, *Meyer; Naum. Vogt.* t. 285; *Gould. B. Eur.* pl. 347; *Jerd. B. Ind.* iii. 779; *Str. F.* i. 258; iv. 26, 197; vii. 494; viii. 421; *Hume and Marsh. Game B. of Ind.* iii. p. 55; *Murray, Hdbk., Zool., &c., Sind*, p. 233. *Hans*, Sind.—The Grey Lag Goose.

Head, hind neck and nape greyish brown, the feathers of the latter slightly darker and forming a conspicuous line on the neck behind, in some uniform grey brown; chin, throat and breast on the upper part pale greyish brown; the breast below whitish, and barred on the sides with greyish; back and scapulars brown, the feathers margined at the tips with fulvous white, forming regular bars; greater wing-coverts greyish brown, lesser slightly paler, both bordered with whitish; primaries white shafted, the first three pale grey, the rest nearly dark brown; tail greyish, tipped with white. The plumage of this Goose is very variable. Of specimens I have, no two are alike. Mr. Hume also notices this fact and says—"In some the head and neck vary from pale ashy or earthy brown to dark clove brown; in most there is a mingled white and orange patch on the forehead; in

some there is a similar spot at the base of the upper mandible on each side, the feathers of the head and cheeks are tinged with orange or rusty, and in most there is a small spot of white on the chin. In some specimens the breast and abdomen are closely blotched and mottled with black or blackish brown and pale rusty buff; in others the cap and back of the upper neck are conspicuously darker, as in the specimen before me, which has the entire breast a fulvous or soiled white, also the middle of the belly, while the flanks are brown and barred with fulvous."

Bill pinkish flesh colour, sometimes with an orange tinge; nail greyish white; irides greyish brown; legs livid fleshy.

Length.—30 to 32 inches, wing 17 to 18·5, tail 6, bill at front 2·4 to 2·8, tarsus 3 to 3·12.

Hab.—Sind, Afghanistan, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch and Guzerat. Occurs throughout Europe. About the Munchur Lake in Sind they are met with in large parties, also along the canals, and especially the river.

Anser albifrons. The White-fronted Goose.

Anser albifrons, *Gm.*; *Naum. Vogt.* t. 289; *Jerd. B. Ind.* iii. 780; *Str. F.* i. 259; viii. 421; *Murray, Faun., Zool., &c., Sind; Hume and Marsh. Game B. Ind.* p. 73.—The White-fronted or Laughing Goose.

Forehead white or yellowish white, followed by a narrow dark band; chin the same; head, hind neck and nape brownish grey, shaded in some specimens with reddish; throat pale greyish white, darker in some; breast and flanks pale brownish, with cross bars of black; paler and whitish on the lower breast, with broader black bars; back dark greyish brown, the feathers with pale reddish brown edges; upper and under tail-coverts white; tail with the middle feathers dark grey, tipped with white; the lateral ones entirely white; primaries ashy grey, dark at the tip; secondaries bluish black; tertiaries margined with dull white; greater and lesser wing-coverts grey, edged with rufous;

abdomen white; bill livid fleshy or purplish red, the middle of the upper mandible with an orange tinge; nail at tip white or yellowish white; legs and feet orange.

Length.—27 to 28 inches, wing 16 to 17, bill at front 1·7 to 1·9, tarsus 3.

Hab.—Sind, Beloochistan (Quetta) Persian Gulf (Bussorah) Afghanistan (Arghandab) Punjab, N. W. Provinces and Oudh.

In Sind the white-fronted Goose is much more rare than the Grey Lag. Mr. Hume says "that about one bird of this species visits this empire, for every thousand of Grey Lags, or every five thousand of the Barred-headed Geese." In Egypt it is most abundant, also at Fao in Mesopotamia, and on the Caspian.

Anser indicus, *Lath.*; *Gould. C. B.* pl. 80; *Jerd. B. Ind.* iii. p. 782; *Str. F.* iv. 499; vii. 491; viii. 421; *Murray, Hdbk., Zool., &c., Sind*, p. 234; *Hume and Marsh. Game B. Ind.* p. 81. *Raj-hans*, Hind, Sind.—The Barred-headed Goose.

Head and a broad line continued down the sides of the neck white, with a broad black band from behind the eye across the occiput, and a second one on the nape; chin and throat white; back of neck dark hair brown; front of neck the same, but rather paler and gradually passing into the ashy grey of the breast; upper back, scapulars, breast, upper abdomen and flanks in front ashy grey, the feathers margined with white and forming lunules of that colour; lower back, rump and wing-coverts pale ashy grey; upper tail-coverts, tip of tail feathers, lower abdomen, vent and under tail-coverts white; axillaries pure ashy grey, feathers of the flanks behind the legs dark rufescent or snuff brown, margined at the tip with white; primaries white shafted, the first four and all the primary coverts greyish, the rest and the tips of the first four as well as all the secondaries dark brown; wing-coverts like the lower back and rump; bill orange, with a greenish tinge at the base; nail at the tip black; legs bright orange; bill at front 1·8 to 2.

Length.—27—28 inches, wing 16·3 to 18·5, tarsus 2·8.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Central Provinces and Bengal. A winter visitant.

This is certainly the most abundant Goose in Sind, and during the winter may be met in flocks of thousands on the large lakes, and on the Indus. On the Munchur it simply swarms, and not unlike the two other species, *albifrons* and *cinereus*, feeds during the night and in the early morning till about 9 or 10 o'clock. They feed exclusively on tender shoots of grass, and do much damage to the sprouting corn crops, especially in the neighbourhood of the Munchur, also in lower Sind. Taking Upper India (including Sind) Hume says—"This species enormously outnumbers all the other species of Geese put together." I think at least five of the Barred-heads visit India to every one of the Grey Lags, and as for all the rest of the Geese, they are apparently so rare, that when one comes to consider numbers, they are not worth speaking about * * *. Their habits are similar to those of the Grey

Lags. Where frequently disturbed they feed inland only at night; where rarely molested they will be found feeding up to eight or nine in the morning, and again long before sunset. Preferentially they feed in fields in the neighbourhood of the larger rivers, browsing on the young wheat, vetches, lentils, &c. They are not difficult to bag, especially in localities where they are not disturbed by shooting. Walking beside a pony, or bullock, one can always get within 35 or 40 yards of a flock, and bag at least a dozen birds with a couple of effective shots. In localities which have been frequently shot over the birds are very wary, and unless there is plenty of cover a buffaloe or pony becomes a necessity. "In such cases," as Mr. Hume says, "it is best to make sure of your one or two birds on the ground with the first shot, as you will seldom have time for more than one shot after they rise." Mr. Hume, in his *Game Birds of India*, gives many hints as to shooting geese and wild fowl generally. The habits of the Duck tribe and the various methods adopted for netting them are very interesting, and of much value to sportsmen generally.

Family, ANATIDÆ.—*Vigors.*

Bill flat, broad, laminated at the sides.

Sub-Family, PLECTROPTERINÆ.—*G. R. Gray.*

Bill long and broad, tip horny; knee and above bare; tarsi with squarish scales; hind toe long; wing with one or more spurs on the shoulder; a fleshy carbuncle at base of upper mandible; plumage glossy black.

Gen. **Sarkidiornis.**—*Eyton.*

Characters those of the Sub-Family. 1st and 2nd primaries subequal and longest.

Sarkidiornis melanonotus, *Penn. Ind. Zool.* pl. 11; *Jerd. B. Ind.* iii. 785; *Str. F.* iv. 27; vi. 486; viii. 387; *Murray, Hdbk., Zool., &c., Sind,* p. 234; *Hume and Marsh. Game B. Ind.* iii. p. 91.—THE COMB DUCK.

Top of the head and back of neck black, spotted with white, more so on the back of the neck; cheeks, sides and front of the neck white, with a few black spots; breast and entire under parts white; chin and throat white; back, scapulars, tertiaries and wing-coverts glossy black, glossed with purple; upper tail-coverts glossed greenish; primaries and secondaries black; the lesser wing-coverts glossed with purplish green; tail black; bill of male with a fleshy protuberance; irides dark brown; bill black.

Length.—28 to 30 inches, wing 13 to 15, tail 6. Female is smaller, and less brightly coloured.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Kutch, Kattiawar, Guzerat, Concan and Deccan, South India and Ceylon.

A straggler in Sind. Breeds in the N. W. Provinces during July and August. In Ceylon it is said to breed from January to March, usually on trees, in the proximity of a large sheet of water.

Sub-Family, TADORNINÆ, (Anatinæ, *Sw.*)

Plumage rufous; bill flattened towards the tip, with a horny termination; hind toe long and slightly lobed.

Dendrocygna, *Sw.*—Whistling Ducks.

Bill rather large, of uniform width; secondaries long, also the tarsi; 2nd, 3rd and 4th primaries sub-equal and longest.

Dendrocygna javanica, *Horsf. Trans. Linn. Soc.* xiii. 199. Dendrocygna awsuree, *Sykes, P. Z. S.* 1832, p. 168; *Jerd. B. Ind.* iii. p. 789. Dendrocygna arcuata, *Cuv. apud. Horsf., apud. auct., nec. Horsf.*—The Whistling Teal.

Top of head and occiput dull wood brown, and a narrow streak of the same continued down the middle of the back of the neck from behind the nape; sides of the face and neck fulvous brown; chin and throat albescent; lower neck and breast yellowish chestnut, gradually passing into the light chestnut of the under surface of the body; vent and under tail-coverts albescent; back and scapulars dusky brown, the feathers edged with dingy fulvous chestnut, forming lunules; upper tail-coverts chestnut; tail brown, tipped slightly paler; primaries and secondaries black; greater coverts and tertiaries dusky brown; lesser and median coverts deep maroon; axillaries black; bill dusky brown, darker at the tip; irides deep brown; eyelids bright yellow to pale golden; legs plumbeous.

Length.—17·5 to 18 inches, wing 8 to 8·5, tail 2 to 2·12, bill at front 1·5, tarsus 1·75.

Hab.—Sind, Punjab, N. W. Provinces and the Indian Peninsula generally, but not in the more arid tracts, where water is not abundant as in the interior of Rajputana. According to Hume, there is scarcely any suitable locality within the limits of the Indian empire, including Burmah, Ceylon, the Andamans and Nicobars, in which this species does not occur either as a permanent resident or a seasonal visitant. It is essentially a tree duck, and in the breeding season especially affects the larger pieces of water, in the vicinity of trees. At other times it is found in nearly every suitable piece of water. It nidificates on trees, making a nest of twigs, &c., or occupying old nests of Herons, &c. In Sind it has been found breeding in great numbers on the Eastern Narra, and I have taken a nest of 11 eggs at the One Tree Tank, 6 miles from Kurrachee. Mr. Doig, who took its eggs in the Narra, found 10 as the greatest number from any one nest. "The nests," he says, "were composed of green twigs, and in some instances of leaves of the large bulrush trodden down to make a platform." Mr. Hume (*Game Birds*) records instances of the curious fact of this species carrying its young in its feet from the nest to the water. Mr. Kemp in the Futtehpore District adds his testimony to the fact, having obtained an egg from off a narrow ridge where the bird was seen to carry it, just before he shot it. Mr. Hume

says—"He heard of their being seen flying down to the water with ducklings on their backs, and that twice he saw them carrying these in their claws. On one of these occasions between 8 and 9 A. M. he saw a duck carry down her whole brood of seven, one at a time, from a hole in a huge mango tree to the water, she passing each time within three yards of his face."

Dendrocygna fulva, *Gmel. Syst. Nat.* i. 530, 1788; *Baird, Birds N. Amer.* pl. 63, 1. Dendrocygna major, *Jerd. Ill. Ind. Orn.* pl. 23; *id. Birds Ind.* iii. 790; *Str. F.* vii. 463; *Murray, Hdbk., Zool., &c., Sind*, p. 234.—THE LARGER WHISTLING TEAL.

Top of head and sides of the face rufescent brown, slightly paler on the cheeks; chin and throat albescent, a broad ring or patch of white in the middle of the neck; a broad black line down the back of the neck from below the nape; back, scapulars, primaries, secondaries, tertials and greater wing-coverts dark brown, the feathers of the back with rufescent or chestnut edgings, forming lunules; lesser wing-coverts dark maroon; breast yellowish chestnut, gradually passing into the light chestnut of the under parts of the body; vent, under and upper tail-coverts white or fulvous white; tail dark brown; bill plumbeous; irides brown; legs and feet plumbeous.

Length.—20·5 to 21 inches, wing 9·25, tail 2·5 to 2·8, bill from gape 2 to 2·4, tarsus 2·25.

Hab.—Sind, Punjab, N. W. and Central Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Concan and Deccan, also S. India and Ceylon in suitable localities.

Casarca, *Bp.*— Bill moderate; culmen with a knob at the base; nail at tip large; hind toe lobed; wing spurred; plumage from buffy orange to bright orange.

Casarca rutila, *Pall. Hist. d' Egypt.* t. x. 1; *Gould. B. Eur.* pl. 358; *Jerd. B. Ind.* iii. 791; *Str. F.* i. 260; iv. 198; *Murray, Hdbk., Zool., &c., Sind; Hume, Game B. Ind.* p. 123. (Vern. *Mungh*, Sind).—THE RUDDY SHELLDRAKE OR BRAHMINY DUCK.

Male.—Head, on the crown and sides buff, darkening on the nape and hind neck, and gradually passing into deep orange or orange fulvous on the upper back and breast; a seasonal glossy black band round the middle of the neck in males (not present in all specimens); chin buff; upper back, scapulars and breast in front deep orange brown, orange fulvous, or rufescent, the colour being variable; in some specimens the feathers are edged paler; lower back ochreous, the feathers finely vermiculated with black; rump black, also the upper tail-coverts and tail, which have a greenish gloss; lower abdomen and under tail-coverts deep chestnut; in females and in males out of season, and without the black neck collar, the entire under surface from the breast is pale chestnut or fulvous chestnut, sometimes with the feathers round the vent darkening into deeper chestnut; wing spurred at the bend; primaries dark brown; greater coverts and outer webs of secondaries glossy purplish green, forming a broad speculum; lesser and median

coverts white, sometimes with a buffish tinge; tertials like the back, some of the feathers finely vermiculated with brown at the tips; under wing-coverts and axillaries white, also the edge of the wing.

The *Female* wants the black collar at all seasons, and is generally duller in colour, the head being very pale buffy white; the crown and neck in some mouse grey; bill black; irides dark brown; legs black.

Length.—*Males*, 24·5 to 27 inches, wing 14·5 to 15·5, tail 5·5, to 6, tarsus 2 to 2·4, bill at gape 2.

Hab.—Sind, Persia, Beloochistan, Afghanistan, E. Turkistan, Punjab, N. W. Provinces, Oudh, Nepaul, Bengal, Rajputana, Central India, Kutch, Guzerat, the Concans, Deccan and Southern India.

The Ruddy Shelldrake is a winter visitant to India. In Sind it is found on all the large lakes and brooks and along the Indus river in great numbers; and on the Munchur especially; like geese large parties resort to the fields of sprouting wheat in the early morning and at night-fall, and do much damage.

They are extremely shy and wary birds, and as Mr. Reid, in *Game Birds*, remarks—"It will not only keep a sharp look out on its own account, but will fly along the Jheel side before the gunner, uttering its warning note, and put every bird on the *qui vive*."

Tadorna, *Leach.*—Bill short, high at the base, and with a knob; wing tuberculated; nail at tip of bill rather hooked.

Tadorna cornuta, *Gm.* The Shelldrake.

Tadorna cornuta, *Gm. Syst. Nat. P. E.* 53; *Naum. Vogt.* t. 298; *Gould. B. Eur.* pl. 357; *Hume, Game Birds*, p. 136. Tadorna vulpanser, *Fleming; Jerd. B. Ind.* iii. p. 794; *Murray, Hdbk., Zool., &c., Sind*, p. 235.—THE SHELLDRAKE or BURROW DUCK.

Head, sides of the face, chin, throat, and about one-half of the neck all round deep black, with glossy green reflections; below this the neck all round is white, as are also the back, wing-coverts, rump, upper tail-coverts and tail, the latter tipped with black; a broad band of ferruginous or orange chestnut across the breast, meeting above on the foreback; under surface white, except a mesial band in the middle of the abdomen; primaries black; greater coverts forming the speculum, and outer webs of the secondaries glossy golden green; upper secondaries chestnut on their outer webs; tertiaries and scapulars black; bill blood-red, with a knob at the base of the upper mandible; nail black; bill deep red; irides brown; legs fleshy red.

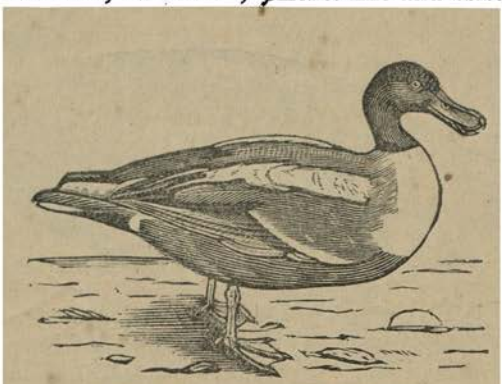
Length.—23-25 inches, wing 12 to 13·5, tail 4·75 to 5·5, tarsus 2 to 2·3. Females average 20 to 22 inches in length, and are much duller in colour.

Hab.—Sind, Beloochistan, Persia, Afghanistan, E. Turkistan, Punjab, N. W. Provinces, Oudh, Bengal, Kutch and Kattiawar Coast. Except in large lakes the Shelldrake is only found on the sea coast, the neighbourhood of the sea being its proper home.

Sub-Family, ANATINÆ.

Hind toe small, not bordered by a membrane; bill even in width throughout, or wider at the tip; lamellæ numerous, fine and bristly.

Spatula, *Boie.*—Bill longer than the head, narrow at the base, broad at the tip, shovel-like; nail small; lamellæ fine and bristly.



Spatula clypeata. The Shoveller.

Spatula clypeata, *Lin.; P. E.* 971, 972; *Gould. B. Eur.* pl. 300; *Jerd. B. Ind.* iii. p. 796; *Str. F.* iv. 199; *Murray, Hdbk., Zool., &c., Sind*, p. 235; *Hume and Marsh. Game Birds Ind.* p. 141. *Vern, Alipat*, Sind.—THE SHOVELLER.

Male.—Head and neck all round deep or dark brown with glossy green reflections; back brown; scapulars and breast white; rump and upper tail-coverts glossy brown black; sides of the rump white; tail brown, the outer feathers white, the rest edged with white; primaries dusky brown, white shafted; secondaries the same, their outer webs rich bright green and forming the speculum; lesser wing-coverts pale blue; greater wing-coverts dusky brown, tipped with white, forming a bar across the wing; tertials long and pointed, pale blue on their outer webs, purplish black on the inner ones, the tips of some of the elongated ones white; abdomen rich chestnut brown or brownish red; lower tail-coverts black, glossed greenish; flanks chestnut brown, the feathers finely vermiculated with dark brown; bill black; legs orange; irides yellow.

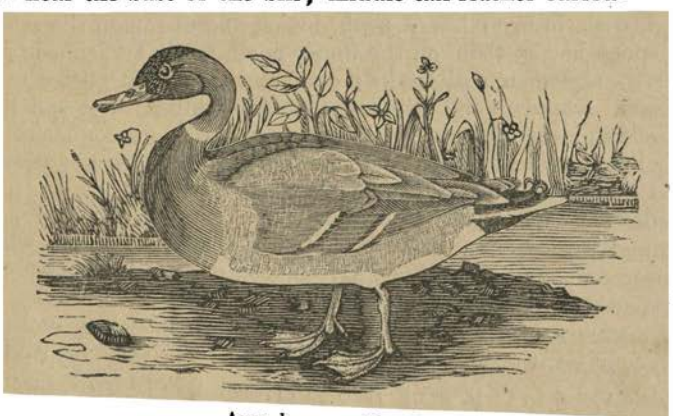
Length.—19 to 20 inches, wing 9 to 10, tail 3·5 to 4, tarsus 1·2 to 1·4, bill from gape 2·9 to 3.

The *Female* is slightly smaller, averaging 19 inches in length at the outside; wing 8 to 9. The head is pale reddish brown, with dusky shaft-streaks; breast pale brownish rufous, with dusky brown spots; back dusky brown, the edges and tips of the feathers paler and rufous white; lesser wing-coverts tinged with pale blue; speculum green, and a white bar across the wing as in the male.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Nepaul, Kashmir, Eastern Turkistan, Punjab, N. W. Provinces and Oudh, Bengal, Central India, Rajputana, Kutch, Guzerat, Concan, Deccan, South India and Ceylon.

Winter visitors to India, affecting all the lakes, marshes, ponds, &c., feeding on worms, larvæ, tadpoles, seeds and young shoots of aquatic plants. They are not naturally shy, as in village ponds they are frequently seen dabbling about, or standing in the shallow edge of ponds, while the inhabitants are drawing water or bathing.

Anas, *Linn.*—Bill slightly longer than the head, of nearly uniform width throughout; tertials long and pointed; tail wedge-shaped; nostrils near the base of the bill; middle tail feather curled.



Anas boscas. The Mallard.

Anas boscas, *Linn.*; *P. E.* 776, 777; *Gould. B. Eur.* pl. 361; *Jerd. B. Ind.* iii. p. 798; *Str. F.* i. 261; iv. 199; *Murray, Hdbk., Zool., &c., Sind*, p. 235; *Hume and Marsh. Game Birds Ind.* p. 151. Vern, *Niroji*, Sind.—THE MALLARD.

Male.—Head and upper half of neck rich dark metallic glossy green, succeeded by a white ring; lower down on the back of the neck greyish chestnut brown, with fine transverse greyish waved lines; back above or mantle chestnut brown, the feathers margined slightly paler; scapulars greyish white, the feathers finely marked with transverse wavy brown lines, the outermost ones chestnut; rump and upper tail-coverts blackish green, the sides of the former greyish white, finely vermiculated with brownish; primaries greyish brown, also the secondaries, the outer webs of which are rich shining purple, margined by a velvetty black band and tipped with white; the speculum formed by the shining metallic purple patch is bounded on each side with a bar of black and white; tail with the four middle feathers velvetty black, glossed with greenish, and curled upwards, the rest greyish brown, bordered with white; lower neck and breast deep chestnut; rest of lower parts greyish white, tinged in some specimens with dull yellowish, and marked with close-set transverse undulating brown lines, indistinct in many, and in others strongly marked; under tail-coverts velvetty black; bill dingy olive, greenish at the tip; nail at the tip black; irides brown; legs and feet reddish orange to vermilion.

Length.—22·5 to 24·5 inches, wing 10·75 to 11, tail 4·2 to 4·8, tarsus 1·6 to 1·9. The *Female* is smaller, averaging 21 inches in length.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, the Concans, and a straggler in the Deccan.

Anas pœkilorhyncha, *Gm.*; *Gray, Ill. Ind. Zool.*, pl. 67; *Jerdon, B. Ind.* iii. p. 799, No. 959. (*Huni*, Sind.)—THE SPOTTED BILLED DUCK.

Top of head to the nape behind dark sepia brown, also a line from the base of the upper mandible through the eye, ending in a point behind; supercilium, sides of the face and neck dingy fulvous, minutely speckled with brown; lower neck, breast and abdomen the same, the brown spots larger than on the upper neck, and increasing in size on the breast, abdomen and flanks; chin and throat unspotted fulvous; upper back, scapulars and lesser and median wing-coverts hair brown; lower back and rump black; primaries deep brown; secondaries brown on their inner webs; speculum on their outer webs, rich emerald glossy green, tipped with black, the black tips of the innermost narrowly edged with white; greater wing-coverts sepia brown at base, with a subterminal white band and tipped with black; tertiaries white on their outer webs and hair brown on their inner; tail deep brown, the central feathers darker; vent and under tail-coverts nearly black; under wing-coverts white; bill black, with a spot of red at the base, and yellow at the tip; legs and feet vermilion red; irides deep brown.

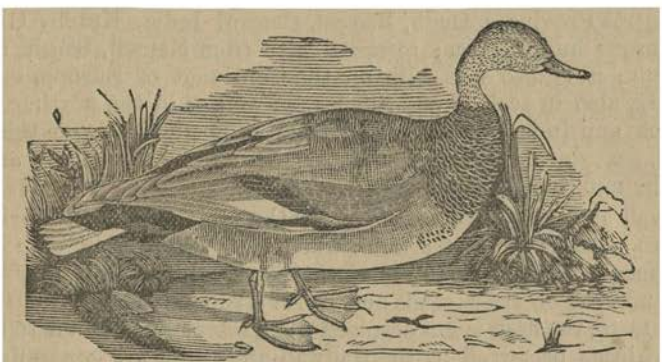
Length.—23·5 to 25·9, wing 10·5 to 11, tail 4·75 to 5·75, tarsus 1·85 to 1·93, bill from gape 2·5 to 2·75. Females are slightly smaller.

Hab.—A permanent resident in India. Breeds in Sind and the Punjab. Found in large numbers in Sind, Beloochistan, Persia, the drier parts of the Punjab and Rajputana, also in the N. W. and Central Provinces, Oudh, Kutch, Guzerat and the Deccan.

Affects large lakes, ponds, brushy or weedy tanks, and often the banks of rivers, feeding on worms, molluscs, insects, larvæ, young shoots of grass, &c. Mr. Hume says, (*Game B.* iii. p. 168) "that the breeding season of this duck varies a great deal with locality"; in the N. W. Provinces and Oudh, also the eastern portions of Rajputana and the Punjab, July, August and September are the months; in Guzerat, October. In Sind Mr. Doig obtained eggs at the latter end of April and May on a small island covered with long grass in the middle of the Narra.

Chaulelasmus, *G. R. Gray, Syn.* Chauliodus, *Sw. Cl. of Birds.* f. 330, *b.*

Bill as long as the head, of uniform width, except towards the tip, where it is slightly narrowed; nail small; lamellæ projecting and delicate; wings and tail long; the central tail feathers rather elongate.



Chaulelasmus strepera. The Gadwall.

Chaulelasmus strepera, *Linn.; Pl. En.* 958; *Gould. B. E.* pl. 366; *Jerd. B. Ind.* iii. p. 802, No. 961; *Murray, Hdbk., Zool., &c., Sind,* p. 235; *Hume, Game B. Ind.* p. 181. (*Burd,* Sind; *Beykur,* Punjab.)—THE GADWALL.

Male.—Head and neck fulvous or greyish white, freckled with brown; crown of the head with a slight yellowish tinge; chin and throat greyish white, finely speckled with brown; breast brown, with white crescent-shaped lines on each feather; abdomen white, minutely speckled with greyish brown; the flanks variegated with undulations of brown and white; back above clove brown, with narrow crescentic undulations; scapulars with narrow undulations of brown and white; rump and upper tail-coverts bluish black, with a purplish gloss; lower tail-coverts glossy black, tinged with green; tail brownish grey, the edges of the feathers paler or fulvous, the two central feathers pointed; primaries dark brown; secondaries nearly black; the speculum

a tri-coloured bar of purple red, black and white, except the four first feathers, which are grey at base and black at the tip; tertials brownish grey; greater wing-coverts glossy black; lesser wing-coverts grey, marbled with yellowish or fulvous white; median coverts rich chestnut brown, varied in some with orange brown, the tips of the feathers nearest to the speculum broadly bordered with black; bill brownish black or dusky leaden, tinged with reddish beneath; irides dark brown; legs pale orange.

Length.—19·5 to 21·5, wing 10·75 to 11·5, tail 3·9 to 4·2.

The *Female* is smaller, has a light superciliary streak; the head on the crown is black mixed with greyish white; sides of the face fulvous white with brownish streaks; neck in front spotted with dark brown, and marked on the breast with crescentic bands of dark and pale brown; chin and throat white; abdomen white; back deep dusky brown, the feathers edged with buff; lesser wing-coverts greyish brown, edged paler; speculum dull white; tail dark brown, marbled with pale buff, brown and white.

Hab.—Central and South Europe, and nearly throughout India; found in Sind, Beloochistan, Afghanistan and Persia, also in the Punjab, N. W. and Central Provinces, Oudh, Bengal, Central India, Kutch, Guzerat, the Concans and Deccan; recorded also from Nepaul, Gilgit, and E. Turkistan; it is also met with on the Continent of Europe, in Spain and Italy, also in Iceland and Siberia, as well as in the northern parts of Africa and India generally. In Sind it is numerous on the lakes, dhunds, &c., during winter, and especially on the Munchur, arriving about the middle of November.

Gadwall are considered excellent for the table, especially during the first two months of their arrival, when they usually feed on rice and young shoots of the sprouting wheat crops. Later on they affect the jheels and feed on crustaceans and fry of fish, and though then rather fishy in taste, the flesh is not despised when better game is not to be had. The localities preferred by the Gadwall after dusk are generally lakes, jheels and ponds covered with long herbage, but during the day it frequents open waters, as the broads of the Indus.

Chaulelasmus angustirostris, *Menetries*; *Bp. F. Ital.* t. 47. i., 2; *Gould. B. Eur.* pl. 373; *Str. F.* i. 262; iii. 273; vii. 493, 523; *Murray, Hdbk., Zool., &c., Sind,* p. 235; *Hume, Game B. Ind.* p. 237.—THE MARBLED TEAL.

"The male has the forehead, crown, occiput, and nape brownish white, with numerous narrow, close-set, wavy, irregular, dark brown bars, which become more speckly on the occiput, where also the ground colour is a more rufescent brown; feathers immediately round the eye very dark brown; a broad irregular stripe over the eye, and a large patch on the side of the head behind the eyes, moderately dark brown, shading into the very dark brown immediately surrounding the eyes; the whole space between the sides of the upper mandible and the dark feathers surrounding the eye, the whole sides of the head below the dark eye and ear patch, the whole chin, throat

and front of the neck, slight greyish or brownish white, very narrowly, regularly and closely streaked with brown; the lower parts a slightly brownish white; the breast feathers with greyish brown subterminal transverse bars, mostly more or less concealed by the pale tippings of the superincumbent feathers, and only clearly seen when the feathers are lifted; the sides and flanks similar, but the subterminal bars much broader, and some of the flank feathers with several bars; the vent feathers and lower tail-coverts, generally, with a slightly more rufescent tinge, and with two or more narrow, widely, separated, transverse brown bars; the tibial plumes browner, and with numerous narrow closely-set, but ill-marked, transverse brown bars; the abdomen more or less obsoletely mottled with very pale grey brown, which, on lifting the feathers, is found to arise from more or less faint, irregular, transverse, subterminal, brownish bars.

"The barrings above described are very much more marked in some specimens than in others, in some in fact they are almost entirely obsolete on the abdomen, and can hardly be traced.

"The upper back greyish brown, the feathers with a subterminal richer brown bar; scapulars brown, each feather with a yellowish white terminal spot, and of a much richer brown, the longer ones especially, just above the spot; the tertiaries and secondary greater-coverts are greyish brown, the former obsoletely barred paler; the secondaries are pale grey; the primaries, their greater-coverts, and the winglet pale slaty, the primaries with a silver grey tinge on the outer webs towards the tips; the inner webs pale grey brown, except towards the tips, where they are much darker, and where the shafts also are conspicuously darker; the middle back, rump, and upper tail-coverts the same grey brown as the upper part of the back; the feathers of the middle back narrowly and obscurely tipped with yellowish white, those of the rump and upper tail-coverts more broadly and conspicuously so, and with a subterminal dark brown spot; the longest of the upper tail-coverts are very broadly and conspicuously so tipped, and have a subterminal dark band; the tail feathers pale grey brown, broadly tipped, and narrowly margined with yellowish white; the two central tail feathers darker on the inner webs and dark shafted, and the lateral tail feathers paling as they recede from the centre.

"The female is similar, but smaller, with the eye patch and generally all the marking and tints duller and less conspicuous.

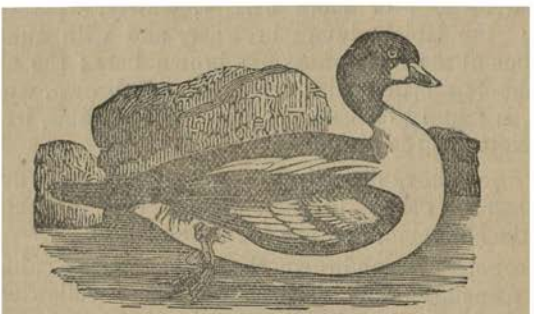
"The legs and feet are dusky olive or dark horny brown; bill bluish grey, black on culmen and tip, or dusky, bounded at the margins of the feathers of the forehead and cheeks with a pale, leaden blue line continued along the margin of both mandibles to near the tip, and a spot of the same colour just above the nail; the irides are brown.

"The dimensions of this species are as follows:—

"*Male.*—*Length* 18·3 to 19, expanse 28·5 to 29·5, tail from vent 3·6 to 4, wing 8·1 to 8·5, wings when closed reach to within 0·7 to 1·5 of end of tail, bill at front, including nail, 1·77 to 1·85, tarsus 1·44 to 1·52, weight 1·3 oz. to 1·5 oz.

"*Female.*—*Length*, 16·9 to 17·5, expanse 27 to 28, tail from vent 2·8 to 3·7, wing 7·9 to 8·1, wings when closed reach to within from 0·5 to 1 of end of tail, bill at front 0·6 to 0·75, tarsus 1·4 to 1·5, weight 1 lb. to 1 lb. 3 oz."—(*Str. F.* i. p. 562).

Hab.—Sind, Beloochistan, Persia, S. Afghanistan, Lower Punjab, N. W. Provinces, Oudh and Bengal; extremely abundant after October; much sought for the table. Feeds chiefly on leaves, roots, fresh water molluscs, &c.



Clangula glaucion. The Golden Eye.

Clangula glaucion, *Lin.*; *P. E.* 802; *Gould. B. Eur.* pl. 379; *Murray, Hdbk., Zool., &c., Sind*, p. 238; *Hume, Game Birds*, iii. p. 285.—The Golden Eye or Garrot.

"*Male.*—The bill is black; the iris yellow; the feet orange yellow with the webs dusky; the claws brownish black; the head and upper part of the neck are glossy deep green when seen in a light reflected at a small angle, but otherwise purple; the throat brownish black; between the lateral basal sinus of the upper mandible and the cheek is an ovate patch of white, ten-twelfths across in its greatest diameter; the lower neck all round, the breast, fore part of the abdomen, sides, and lower tail-coverts white; but the axillary feathers and lower wing-coverts are blackish brown, and the edges of the posterior elongated feathers on the sides black; the back and the inner and posterior scapulars are black; the outer scapulars white with the margins black; the tail is deep brown, tinged with grey; the sides of the rump and tibiæ dusky grey, and the feathers on the hind part of the abdomen dusky at the base; the wing may be described as brownish black, with a large patch of white, which includes many of the small coverts, several of the secondary coverts, and eight of the secondary quills; these white secondary coverts have their basal half black, but that colour is not apparent when the feathers are laid.

"*Length.*—To end of tail 19 inches, extent of wings 32, wing from flexure 9, tail 4, bill along the edge 1·42, tarsus 1·42.

"*Female.*—The female is much smaller, and has the bill less stout; the feathers of the head less elongated, and less glossy, as are the scapulars and the feathers of the sides; the bill is light brown, yellowish on the ridge towards the end, with the upper unguis dusky; the lower yellowish

brown; the tarsi and toes are of a dingy yellowish brown; the interdigital membranes dusky; the claws brown; the head and upper neck are umber brown; the lower neck all round dull ash grey, the feathers terminally edged with paler; the lower parts are white, but the sides of the body and rump, with part of the abdomen, are grey; the axillars and lower wing-coverts brownish grey; the back and scapulars are deep ash grey, but on the hind part of back that colour shades into black; the tail dark brown, tinged with grey; the smaller wing-coverts are deep grey, many of them tipped with pale grey; the primaries, their coverts, four outer secondaries, and five inner, with their coverts brownish black; the seven other secondaries pure white, as are their coverts, unless at the base.

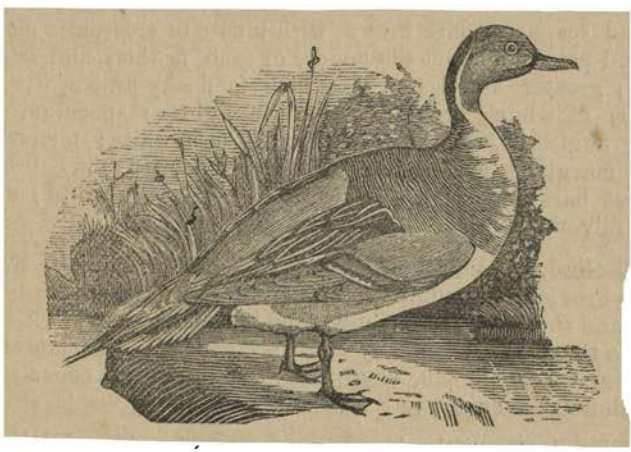
"*Length.*—To end of tail 16 inches, expanse 28, wing 8·25, tail 3·25, bill along the ridge 1·25, tarsus 1·25."—*Mac Gillivray, Br. B. ex Str. F.* vii. 441.

Hab.—Sind, Lucknow (*Bonavia*) North Afghanistan.

This species has not to my knowledge been obtained in Sind during the last thirteen years. "Sir A. Burnes obtained a specimen on the Indus, which is figured among his drawings in the possession of the Asiatic Society."

Dafila, *Leach.; Gray, Gen. Birds,* iii. p. 615.

Tail with the central feathers narrow and much lengthened beyond the rest; neck long; bill elevated at the base, of nearly uniform width; 1st primary of wing longest.



Dafila acuta. The Pintail.

Dafila acuta, *Lin.; P. E.* 954; *Gould. B. Eur.* pl. 365; *Jerd. B. Ind.* iii. p. 803; *Str. F.* i. 261; iv. 29, 200; *Murray, Hdbk., Zool., &c., Sind,* p. 235; *Hume, Game Birds Ind.* p. 190. (*Sink-par,* N. W. Provinces; *Kokarallee, Dreegush,* Sind.)—THE PINTAIL.

Male.—Entire head, face, chin and throat umber brown, the feathers on the crown slightly darker and with a ferruginous tinge; back of the neck dark brown, nearly black; lower neck, breast and abdomen white; a white line running up on each side of the neck to the occiput; back, sides of the breast and flanks marked with transverse undulations of black and white; upper tail-coverts cinereous or pale fulvous brown; under tail-coverts deep velvet black; tail with the central feathers black, much elongated, black and glossed with greenish, the others dusky brown and margined with white; primaries dusky greyish brown, the shafts much paler; secondaries dusky brown on their inner webs, their outer webs forming the speculum, dark greenish bronze, edged with black and tipped broadly white; upper part of the speculum edged with the pale ferruginous tips of the greater coverts, which, like the lesser and median coverts, are dusky brown; scapulars black, edged with yellowish; tertiaries long and pointed, deep black and edged with whitish; bill black, with a bluish tinge on the sides of the upper mandible; legs and feet slaty or blackish grey; irides dark brown.

Length.—22 to 29 inches, wing 10·3 to 11·75, tail 7·5 to 8, bill 2 to 2·45.

Females.—Smaller. *Length.*—20 to 22·5, wing 9·3 to 10.

Female.—Forehead and crown, also back of the head, nape and neck dark brown, the feathers with fulvous edgings; sides of the face, chin, throat and foreneck fulvous with brown spots and streaks, which become longer and darker on the lower neck; breast and the lower parts fulvous with obscure crescentic brownish markings on the breast, flanks and sides of the rump and large spots on the lower abdomen; back and scapulars dark brown, with lunate or crescentic markings of white and pale buff about the middle of each feather, and edged with whitish; greater and lesser wing-coverts dusky brown, with margins and tips of white; primaries a shade lighter; speculum brownish bronze, unglossed, the tips of the feathers white; tertiaries dusky brown, margined with white; tail long, pointed, dark brown, with imperfect bars and streaks of white or yellowish white; under tail-coverts fulvous white, with brown spots.

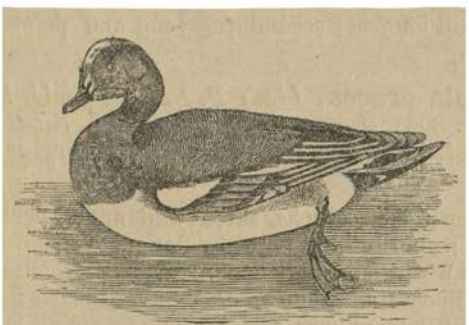
Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Oudh, Bengal, Kutch, Concan, Deccan, Guzerat, Central and Southern India and Ceylon. Hume says—"There is no district in the Empire, from Ceylon to Kashmir, from Kashmir to Sadya, Munipoor and Moulmein, where the Pintail does not occur in greater or less abundance except in South Tenasserim.

The Pintail affects the large broads or dhunds and lakes, and is seldom seen except in large parties. It is held in much estimation for the table, and for this purpose is netted in great numbers with the Gadwall and other water birds. On the Munchur Lake the fowlers net from 100 to 200 daily, and a sportsman in suitable localities could obtain two or three dozen at least as a good day's sport, besides other game. Hume, like myself, thinks that on the whole, next to the

Mallard, the Pintail is the best duck for the table in India, the Gadwall ranking next.

Mareca, *Steph.; Gray, Gen. B.* iii. p. 614.

Bill uniform in width; laminæ prominent; first and second quills of wing longest; tail short, cuneate; hind toe small.



Mareca penelope. The Wigeon.

Mareca penelope, *Lin.; P. E.* 825; *Gould. B. Eur.* pl. 359; *Jerd. B. Ind.* iii. p. 804; *Str. F.* i. 261; iv. 30; vii. 494; *Murray, Hdbk., Zool., &c., Sind,* p. 235; *Hume, Game Birds Ind.* p. 198. Mareca kagolca, *Gm. N. Comm. Petrop.* xv. t. 21. (*Pataree,* Punjab; *Parrow,* Sind.)—The Wigeon.

Male.—Forehead and crown creamy yellow, remainder of head and neck rich chestnut; cheeks speckled with black, also a speckled band down the middle of the throat in some; nape narrowly barred with black and pale reddish white; chin and throat black; lower neck and breast vinaceous red, lightest in front, darkest on the sides; abdomen white, the flanks with transverse undulating lines of black and white; under tail-coverts black, with a greenish gloss; tail blackish grey; back minutely barred with transverse undulating lines of black and white; scapulars black, edged with white; wing-coverts white, the greater ones with velvet black tips; speculum glossy green, bounded above and below with black; bill plumbeous, the base black; legs and feet plumbeous or brown; irides red brown.

Length.—19 to 19·5, wing 10 to 10·5, tail 4 to 4·5, bill 1·7 to 1·82. The *Females* are smaller; *length* 17·5 to 19, wing 9·3 to 10 inches, tail 3·5 to 5. In colouring the female has the head and neck fulvous brown, speckled with dusky; upper parts dusky or deep brown, the feathers with reddish edges; speculum without the green gloss; feathers of the flanks rufous brown, tipped with ashy.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Oudh, Bengal and throughout Western and Central India, rare in Southern India, and not yet recorded from Ceylon. In Kattiawar, Rajputana, the Deccan and Concan it is not uncommon

during the winter months. It is considered excellent eating for the first two months after arrival, but after this the flesh is said to become of a muddy flavour and unpalatable.

Querquedula, *Steph.*; *Gray, Gen. B.* iii. p. 616.

Bill of uniform width, as long as the head, and slightly raised at the base; nail horny, hooked and narrow; lamellæ not apparent; wing long, second quill longest; secondaries long and pointed; tail wedge-shaped.

Querquedula crecca, *Lin.*; *P. E.* 946; *Gould. B. Eur.* pl. 364; *Jerd. B. Ind.* iii. 806; *Murray, Hdbk., Zool., &c., Sind*, p. 235; *Hume, Game Birds Ind.* iii. p. 206. (*Kardo*, Sind; *Moorghabi*, Hind.)—The Common Teal.

Forehead, crown, face, cheeks, throat and upper neck in front rich chestnut brown; chin black; a narrow dark line round the base of the bill, followed by a white or buffy one on the side, which meets a similar coloured superciliary stripe, and another under the eye; behind the eye, between the hind superciliary and lower eye-streak is a broad glossy green, or dark green patch, which meets on the back of the neck; breast rufescent or white, tinged with reddish and spotted with black; upper abdomen white; lower abdomen in some minutely barred with brownish; flanks barred with brown or blackish brown; upper back and scapulars marked with undulating white and black transverse bars; lower back dark brown, with faint traces only of paler transverse bars; tail hair brown or dusky brown, the feathers edged with white; under tail-coverts black, the feathers on the sides creamy yellow; primaries dusky brown, edged on their outer webs and tipped darker; first six secondaries velvet black on their outer webs; next four or five forming the speculum glossy green, and followed by the black outer web of the first tertial; lesser and median coverts dusky or greyish brown; greater coverts the same and tipped with white or yellowish white, forming a border to the speculum above; bill black, or brownish black; irides brown; legs and feet greyish or plumbeous.

Length.—14·5 to 15·75 inches, wing 7 to 8, tail 2·9 to 3·5

The female has the head, neck and upper parts dusky brown; the feathers edged with white or fulvous white on the head and neck and lunated on the back; speculum as in the male, but slightly duller; chin and throat white, with black spots; breast and flanks white and spotted with dark brown; abdomen white; under tail-coverts with brown streaks.

Length.—13·5 to 14·7 inches, with a wing of 6·5 to 7·5.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Rajputana, Kutch and throughout India.

Abundant wherever it occurs, frequenting tanks, rivers, ponds and jheels, &c.

Querquedula circia. The Garganey or Blue-winged Teal.

Querquedula circia, *Lin.*; *P. E.* 946; *Gould. B. Eur.* pl. 364; *Jerd. B. Ind.* iii. p. 807; *Str. F.* iv. 201; *Murray, Hdbk., Zool., &c., Sind*, p. 235; *Hume, Game Birds Ind.* iii. p. 215.—THE GARGANEY or BLUE-WINGED TEAL.

Male.—Forehead purplish brown, finely streaked with white; crown of the head, occiput, nape, and a line half way down the back of the neck dark umber or blackish brown, bounded on each side by the white superciliary streak, which extends to the sides of the neck; face, sides of the neck, cheeks, throat and neck chestnut brown, the feathers with white mesial streaks; chin black; breast and upper abdomen yellowish brown, tinged in some specimens with ferruginous, and with broad crescentic dark brown markings; lower abdomen white or yellowish white, with, in some specimens, transverse, dusky striæ behind; flanks with transverse undulations of black and white; axillaries white with black bases; back brownish black, the feathers edged with yellowish brown; primaries dark brown on their outer webs and tips, pale wood brown on their inner webs, in some specimens narrowly edged with whitish; wing spot on outer web of secondaries dull green, slightly glossed and tipped with white, the white tips forming the second bar across the wing; greater coverts ashy grey or bluish ashy, broadly tipped with white; lesser and median coverts ashy grey, or bluish ashy; scapulars long and lanceolate, black, with a mesial white shaft, and narrowly edged greyish white, or white; tertiaries dusky brown, edged with white on their outer webs; rump and upper tail-coverts dark brown, with bars of yellowish white; tail dark brown, the feathers edged with yellowish or fulvous white; under tail-coverts yellowish white with black spots; bill black above, brownish on the lower mandible; irides brown; legs and feet greenish grey or plumbeous.

Length.—15·5 to 16·5 inches, wing 7·2 to 8, tail 3·2 to 3·5, bill 1·75 to 1·85.

The *Female* has the chin and throat white; head on the crown brown with spots and streaks of a darker shade; back of neck brown, the feathers edged with white; eye-streak faint; speculum dull and

indistinct, bordered above and below with white; breasts and abdomen greyish white, spotted with brown.

Length.—14·5 to 15 inches, with a wing of from 7 to 7·5.

Hab.—The same as *Q. crecca.*

Not found in as great numbers as *Q. crecca,* affects the same situations, and is considered excellent for the table. It is chiefly a nocturnal feeder, concealing itself in the jheels and dhunds, among the high grass during the day; when disturbed it usually returns to the same spot. Hume says "that at nights they come in some parts of the country in such crowds into paddy fields as to destroy acres of crop at one visit; their food, like *Q. crecca,* is chiefly vegetable, as tender shoots and leaves of water plants, seeds, bulbs, &c., but on the sea coasts, especially the Sind and Mekran Coast, where they are frequently found in some numbers, crustacea, slugs, fry of fish and algæ form their diet."

Querquedula formosa. The Clucking Teal.

Querquedula formosa, *Georgi. Act. Stockl.* 1779, t. i.; *Schl. F. J.* t. 82, *B.* Querquedula glocitans, *Pall.; Jerd. B. Ind.* iii. p. 808; *Hume, Game Birds Ind.* iii. p. 225.—THE CLUCKING TEAL.

"*Male.*—Forehead, top of head and occiput rich purple brown, bounded by a narrow white line from the eye; face, cheeks and sides of neck fawn colour; a black streak from below the eye meeting a black patch on the throat; nape and hind neck glossy green, ending in a black stripe down the back of the neck, separated from the fawn colour of the sides of the neck by a narrow white line; upper plumage finely marbled grey, edged with rufous on the back; upper wing-coverts hair brown, the median coverts the same, with an edging of rufous, forming the anterior margin of the speculum, which is glossy green, ending in velvet black and bordered posteriorly with silvery white; primaries brown; scapulars lengthened, deep black in the centre, white on their upper side, and rufous externally; upper tail-coverts brown, white on either side; tail of 16 feathers dark brown; beneath the throat black; neck and breast vinaceous purple, paling below

with black spots, abdomen white; flanks mottled grey; under tail-coverts black; bill dusky; legs dusky.

"*Length.*—15·5 inches, wing 8·5, tail 3, bill at front 1·5."—(*Jerd. B. Ind.*)

The *Female* (of which the Kurrachee Museum has a specimen) wants the rich markings on the head and face, which are mottled grey; there is a distinct white superciliary streak and a brown streak behind the eye, also a patch of white above the angle of the upper mandible; chin and throat white; cheeks and sides of the neck white, the feathers with mesial linear streaks; breast rufescent, spotted with dark brown; belly white; lower abdomen and under tail-coverts white, with linear brown spots; back dark brown, the feathers edged with rufous brown; flanks dusky rufescent brown, some of the feathers with whitish edgings; bill 1·62 × 0·62 at its widest part; tarsus 1·6.

Hab.—Sind, N. W. Provinces at Delhi, (*Hume*) Oudh and Bengal.

According to Mr. Hume, this is a rare straggler within the limits of India. Blyth obtained a single specimen (a male) in the Calcutta Bazaar in 1844. Mr. James, C. S., who was for some time in Sind, had a water colouring drawing of the head of a Teal, which Mr. Hume regards as the male of this species, and, besides a female in the Kurrachee Museum, a male was obtained by Mr. Chill at Dehli in 1879.

Sub-Family, FULIGULINÆ, *Sw.*—Diving Ducks.

Bill elevated at base, flat and broad towards the tip; nail strong, broad and horny; tarsi short, rather compressed; toes long, webbed to the end; hind toe short; tail short and rounded.

Fuligula, *Steph.*; Branta, *Boie.*; *Gray, Gen. B.* iii. p. 620.

Bill nearly as long as the head, moderately wide, tip depressed; nail large; lamellæ distant; wings moderate, 1st quill longest.

Fuligula rufina, *Pall. Zoogr.* t. 79; *P. E.* 928; *Gould. B. Eur.* pl. 369; *Jerd. B. Ind.* iii. p. 811; *Str. F.* iv. 201; *Murray, Hdbk., Zool., &c., Sind*, p. 238; *Hume, Game B. Ind.* iii. p. 253. (*Rattoba*, Sind; *Lall-seeree*, Punjab.)—The Red-crested Pochard.

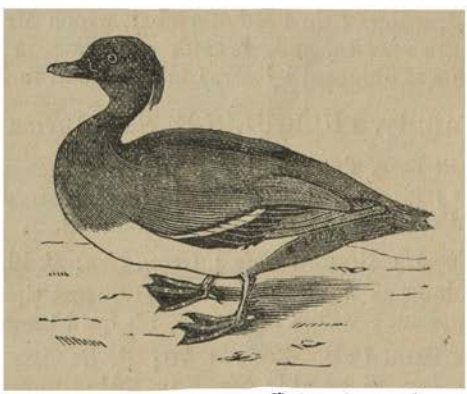
Male.—Crown of the head, with an elongated crest of a silky texture and dull yellow colour; head on the sides, cheeks, chin and throat rich chestnut, with a tinge of rose red or reddish bay; nape and a line continued down the back of the neck black; lower neck, breast, sides of the breast and abdomen black, in some specimens the abdomen is a chocolate brown; flanks white; back pale brown, or yellowish brown; the scapulars with a fulvous tinge; bend of the wing and a large spot on the sides of the back white; primaries brown on their outer webs and at their tips, white on their inner webs; secondaries white, with subterminal dark tips; tertiaries pale brown; rump and upper tail-coverts nearly black; tail dark brown; bill bright vermilion; legs and feet vermilion or reddish orange; irides reddish brown.

Length.—20·5 to 22 inches, wing 10 to 10·75, tail 3·0 to 4·0, bill 2·3 to 2·5.

Females are not much smaller, and average from 20 to 21 inches. Forehead and crown dark brown; the neck on the back and nape slightly paler; crest much less developed; sides of the face and neck brownish white; speculum greyish white; breast and flanks yellowish brown, some of the feathers edged paler; shoulder of wing greyish white; tail yellowish brown; legs and feet reddish brown; back rufous or yellowish brown, some of the feathers edged paler.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. Provinces, Bengal, Guzerat, Kutch, Rajputana, the Deccan and throughout India generally, except in Southern India and Ceylon.

It is said to breed in parts of Persia. Occurs everywhere in large numbers during winter from the latter end of October to about the middle of April, a few however remain beyond the 10th of April. They are not very shy in their wild state, except in well-shot districts, and usually large bags may be made of this duck in a single day; they swim well and dive equally well, remaining a long while under water. Large lakes and rivers, and situations where there is much deep water, are the natural resorts of this duck.



Fuligula cristata. The Tufted Pochard.

Fuligula cristata, *Lin.*; *P. E.* 1001; *Gould. B. Eur.* pl. 370; *Jerd. B. Ind.* iii. p. 815, No. 971; *Murray, Hdbk., Zool., &c., Sind*, p. 238; *Hume, Game B. Ind.* iii. p. 277. (*Turando*, Sind; *Abluk*, Punjab.)—The Tufted Pochard.

Head, neck, long pendent crest and nape glossy black, with purple and green reflections; on the chin a white triangular spot; throat and breast black; back dusky olive brown, or black-brown, tinged with violet; under parts white; vent and under tail-coverts black; greater wing-coverts white, the tips broadly black; lesser wing-coverts like the back; tertials glossy green; bill plumbeous; irides golden yellow; legs and feet dusky.

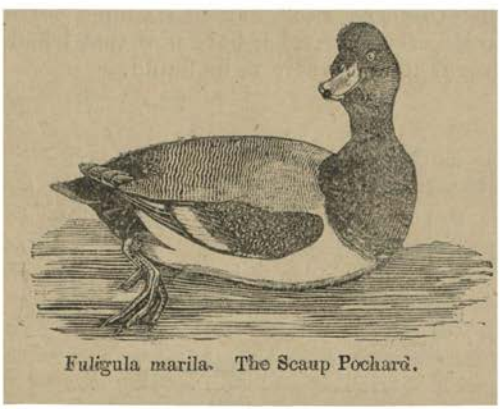
Length.—16 to 17 inches, wing 7·5 to 8·5, tail 2·5 to 3·0, bill 1·8 to 2·0.

Female.—*Length* 15 to 16 inches, with a wing of 7·5 to 8.

The female is dull rufous brown above, with paler edges to the feathers; the crest is less developed and deep rufous brown in colour; feathers about the bill pale yellowish white; breast on the centre yellowish or fulvous white, tinged with greenish; under parts white, with faint dusky bars of brown; speculum white; the under tail-coverts white, with a few spots of pale brown.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Oudh, Bengal, Rajputana, Kutch, Guzerat, Concan, Deccan, Central and Southern India.

This duck frequents chiefly open tanks, jheels and small dhunds overgrown with weeds. It feeds chiefly on small molluscs and insects. In the stomachs of a few obtained by me at Sehwan were species of *Nepidæ*, a species of *Ranatra* being the most common. They dive and swim well, and remain for some time under water in search of minute molluscs, roots and seeds. They are said to be good eating, but after January the flesh has a peculiar flavour, which renders it unpalatable.



Fuligula marila. The Scaup Pochard.

Fuligula marila, *Lin.*; *P. E.* 1002; *Gould. B. Eur.* pl. 371; *Jerd. B. Ind.* iii. p. 814, No. 970; *Murray, Hdbk., Zool., &c., Sind*, p. 239; *Hume, Game B. Ind.* iii. p. 271.—The Scaup Pochard.

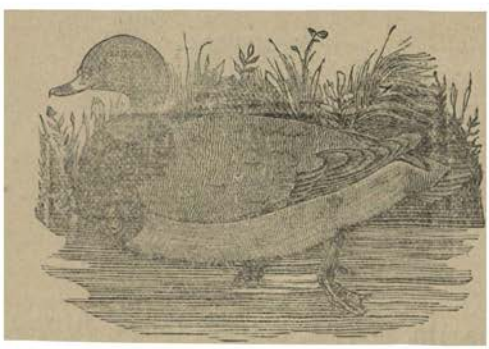
"*Male.*—Head and neck black, glossed with green; top of the back and scapulars whitish, with zigzag black lines; lower back and upper tail-coverts black; tail brown; wing-coverts black, marbled with ashy; speculum white; quills brown; lower neck and breast deep black; abdomen and sides pure white, with brown zigzag markings on the lower portion; under tail-coverts black; bill clear bluish above, dusky below, the tip black; irides brilliant yellow; legs bluish ashy; webs blackish."—(*Jerdon*).

Length.—19 to 20 inches, wing 9 inches, tail 2·5, bill at front nearly 2, tarsus 1·5. The measurements of a female given by Mr. Hume are—*Length* 18 inches, expanse 28, wing 8·75, tail 2·5, tarsus 1·33, bill along ridge 1·83. A specimen of a female in the Kurrachee Museum

measures—*Length* 17·75 inches, wing 7·5, tail 2·8, bill at front 1·62, greatest width 0·81. The forehead, crown and nape are chocolate brown, with a faint gloss; a band of white (loreal) at the base of the bill 0·43 wide, tinged with rufous; chin rufescent white; throat slightly paler than the head; lower neck and breast pale brown, the feathers edged with pale rufescent or earthy brown; abdomen satin white; sides of the vent brownish, with a few white spots; back, scapulars, tertials, wing-coverts and rump and upper tail-coverts dark brown, with a slight gloss; the feathers of the upper back very narrowly edged paler; primaries dark brown on their outer webs, and tips earthy brown on their inner webs; secondaries white, broadly tipped with dark brown and narrowly edged the same on their outer webs; tail dark brown; irides yellow.

Hab.—Sind, Cashmere and Nepaul.

It was not till I took up the Scaups for examination in connection with this work, that I detected this species; like Mr. Hume I had it ticketed as *nyroca*. Mr. Hume's plate of the female of this species, and his description of the specimens in his museum puts its occurence in Sind beyond doubt. The female specimen described was obtained in 1879 at the "*One Tree Tank*," about six miles north of Kurrachee, on the road to Muggur Peer. I believe now that I had the male also, but just at present it is nowhere to be found.



Fuligula ferina. The Pochard.

Fuligula ferina, *Lin.*; *P. E.* 803; *Gould. B. Eur.* pl. 367. Athya ferina, *Jerd. B. Ind.* iii. p. 812; *Murray, Hdbk., Zool., &c., Sind*, p. 239; *Hume, Game Birds Ind.* iii. p. 249.—THE POCHARD, DUN-BIRD or GREAT-HEADED WIGEON.

Head and neck rich or very deep chestnut, glossed with purple in some lights; breast black; back, scapulars and wing-coverts marked with undulating transverse striæ of black and white; rump, upper tail-coverts and vent black; rest of under parts from below the breast covered with delicate zigzag transverse striæ as on the back; primaries dusky brown, with dusky tips; secondaries lead or bluish grey, tinged with brown, and slightly tipped with dull white; tail dark brownish ash.

The female has the head, neck and nape chestnut or reddish brown; the breast of deeper chestnut; the wing-coverts ashy; upper parts as in the male, but the lines less distinct; throat and forepart of the neck reddish white; abdomen ashy or greyish white; bill dark plumbeous; irides orange yellow; legs and feet slaty grey or plumbeous.

Length.—18·0 to 18·5 inches, wing 8·0 to 8·5, tail 2·35 to 3·0, bill 2·15 to 2·25.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab, N. W. and Central Provinces, Oudh, Rajputana, Kutch, Guzerat, Kattiawar, Central India, Northern parts of Southern India, and the Deccan. In the Concan it occurs but only as a straggler; it is not recorded from Ceylon, nor from Nepaul.

The Pochard makes it appearance in Sind about the end of October, and in the Punjab during November. It is usually found in large flocks, affecting the sea as well as inland creeks and fresh waters; its chief food is molluscs; seeds, flower buds of aquatic plants and algæ also when on the sea, probably such algæ as are detached and found drifting in fresh waters. The Pochards affect deep weedy jheels, keeping well under cover during the day, and feeding chiefly by night; they fly with greater rapidity than the Mallards, and unless their haunts have not been shot over, they are very wary and difficult to approach.

Fuligula nyroca, *Guld.; P. E.* 1000; *Gould. B. Eur.* pl. 367; *Naum. Vogt.* t. 309; *Jerd. B. Ind.* iii. p. 813; *Murray, Hdbk., Zool., &c., Sind*, p. 239; *Hume, Game Birds Ind.* iii. p. 263. (*Burnoo*, Sind; *Karcheeya*, Punjab.)—The White-eyed Pochard or Ferruginous Duck.

Forehead, crown, nape, sides of the face, throat and upper neck all round deep ferruginous; breast and sides of the breast the same; chin with a triangular patch of white; a black collar on the lower part of the neck, which behind runs into the purplish glossed dark brown of the back; scapulars and tertials dark brown, also the rump and upper tail-coverts; abdomen pure white; flanks ferruginous; lower abdomen and vent ferruginous brown, with white specklings; lower tail-coverts white; tail dusky brown; lesser, median and greater wing-coverts dusky brown; secondaries white, broadly tipped with dark brown; end of the wing white, also the bases of the inner primaries, and their inner webs; outer webs dusky blackish brown; axillaries white; bill bluish; irides white.

Length.—15·5 to 16·0 inches, wing 7·5 to 7·75, tail 2·0, bill at front 1·9 to 2·0.

The female has the head and neck brown, the feathers edged with ferruginous; chin white, but less extended; breast brown, the feathers margined with pale chestnut brown; abdomen dull white; edge of the wing white; secondaries white, tipped with black.

Length.—14 to 15 inches, wing 7·72.

Hab.—Sind, Beloochistan, Persia, Afghanistan and throughout India, except South India and Ceylon. Occurs in Nepaul, Gilgit and Eastern and Western Turkistan, in which latter it breeds. "In the

lakes of Cashmere," Hume says, "they breed most abundantly, and that boat-loads of their eggs are brought to market at Srinuggar." The White Eye affects chiefly jheels with thick cover, where they sport about in the early morning, afternoon and at night, retiring during the middle of the day. It is not sought for by sportsmen, being very indifferent eating at the best of times.

Family, MERGIDÆ.

Bill straight, much compressed, narrow, convex towards the tip; edges of the mandibles strongly toothed; nostrils median, longitudinal; front toes well webbed, hind toe lobed; tarsus short; wings pointed; tail short, wedge-shaped; head subcrested.

Mergus, *Lin.*—Bill slender, tip hooked; first and second quills longest.

Mergus serrator, *Lin.*; *P. E.* 207; *Naum. Vogt.* t. 325; *Gould. B. Eur.* pl. 385; *Str. F.* ix. 268; *Hume, Game Birds* iii. p. 305.—THE RED-BREASTED MERGANSER.

Adult Male.—The whole head, chin, throat and the neck all round, for about one inch, black, glossed with metallic green on the sides of the head and a bluer sheen elsewhere; along the middle of the crown and occiput runs a comparatively narrow line of excessively narrow, more or less disintegrated-webbed, elongate feathers, of which the longest are over three inches in length, forming a conspicuous crest; the rest of the neck all round, to just the base, pure white, with a conspicuous narrow black line down the centre of its hinder aspect; at the base of the neck a light brownish rufous, or pale brownish chestnut band, extends all round, narrower behind and broadening into a crop patch. This band is streaked longitudinally with blackish brown. The interscapulary region and upper back, the extreme sides of the breast and scapulars velvet black; outside the scapulars and between these and the wing there is a conspicuous patch of long white feathers; the primaries and their coverts (which latter are darkest) the shoulder of the wing and lesser coverts just above the carpus blackish brown, the rest of the lesser and median coverts pure white; the secondary greater coverts black, all, except the first three, very broadly tipped with white, but leaving a portion of their black bases visible below the white median coverts, thus forming the first black bar across the white of the wing; the secondaries are black, all, except the first three, very broadly tipped with white; tertiaries white, conspicuously margined with black, except the last three, which are black; axillaries pure white; rest of the lower parts white, with, in life, a beautiful salmon or buffy tinge which disappears in the skin; flanks white, vermiculated with greyish black; middle and lower back, rump and upper tail-coverts white, with very delicate and close vermiculations of dull black, producing a grey effect; tail dull brown; lower wing-coverts white.

The *Female* has the entire crown, occiput and crest brown with more or less of a dull rufous or chestnut tinge, and rather ashy towards the forehead; sides of the head and neck all round pale dull

brownish chestnut; chin white; throat albescent; breast and entire lower parts white or pinkish white in life, only at the base of the throat and crop the grey brown bases of the feathers show through to a certain extent like hidden bars; interscapulary region, mantle, lower back, rump and upper tail-coverts brown, most of the feathers with paler margins; quills dusky black; secondaries and their greater coverts black, all, but the first three, broadly tipped with white; tertiaries blackish dusky, paling anteriorly, whitish towards the tip, the innermost mostly white, with a black outer margin; tail like the back.

Both sexes from the above description resemble the Goosander, but may be distinguished by their small size, and in proportion to their length much thinner bills.—(*Hume, Str. F.* ix. p. 268).

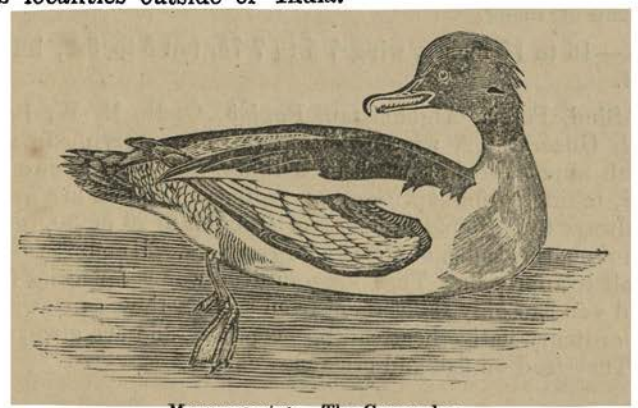
In the male the bill varies from orange red to deep vermilion, is more or less dusky on the edge, and has the nail varying from pale yellowish grey to almost black. In young females there is more dusky on the upper mandible, where the red is often only a lateral band.

Length.—Males, 24·0 to 26·0 inches, expanse 29·0 to 32·5, wing 9·0 to 10·0, tail from insertion of feathers 3·1 to 4·2, tarsus 1·8 to 2·05, bill at front along culmen 2·4 to 2·5.

Length.—Females, 22·0 to 23·5, expanse 28·0 to 31·0, wing 8·5 to 9·3, tail 2·7 to 3·6, tarsus 1·66 to 1·83, bill at front 2·1 to 2·3.—*Str. F.* ix. 268.

In a second specimen (the first obtained by Capt. Bishop at Manora, and sent by me to Mr. Hume) now in the Kurrachee Museum—male, the bill at front is exactly 2·0 inches, tarsus 1·6, wing 8·37, tail 3·7, length 23·2, agreeing exactly with Mr. Hume's description as given above.

Hab.—Sind. Mr. Hume says there is no other instances of its occurence in India. China, Mongolia, S. and S. E. Siberia, Palestine and throughout Europe; Scotland, Shetland, Sweden and Norway are given as localities outside of India.



Mergus castor. The Goosander.

Mergus castor.—The Goosander.

This species, although not yet reported from Sind, will no doubt be found to occur. It is said to occur in the Punjab, N. W. Provinces and

Bengal, and also in Ajmere, and to breed in the higher valleys of the Himalayas, in Beloochistan and Persia. A wood cut of the species is given to aid identification.

Mergellus.—*Selby.*

Bill shorter and wider than in *Mergus;* tip broad and much less hooked; mandible toothed.

Mergellus albellus, *Lin.; P. E.* 449; *Gould. B. Eur.* pl. 387; *Jerd. Birds Ind.* iii. p. 818; *Str. F.* i. 265; iv. 31, 202; *Murray, Hdbk., Zool., &c., Sind*, p. 240; *Hume, Game B. Ind.* iii. p. 293.—THE SMEW.

Male.—A black patch with green reflections from the base of the bill extending round the eye; head white, occiput with a longitudinal black patch descending down the back of the neck; chin, throat, neck, breast (except two crescentic black bands) and lower parts white; flanks and thigh-coverts white, with dark zigzag transverse striæ; back black; greater wing-coverts glossy black, tipped with white; lesser wing-coverts partly white; primaries dusky black; secondaries glossy black, edged narrowly and tipped with white, forming two narrow bands across the wing; tertiaries leaden grey; upper tail-coverts and tail greyish ash; under tail-coverts white; bill light plumbeous with a bluish tinge; irides reddish brown; legs and feet plumbeous.

Length.—17 to 18 inches, wing 7·55 to 8·5, tail 3·37 to 3·9, bill 1·5 to 1·6.

The *Female* has the head, crown, nape and hind neck reddish chestnut brown; sides of the neck white; crest short; back, upper tail-coverts and tail deep ashy grey; chin and throat white; breast greyish white; abdomen white; flanks grey; wings as in the male, but the dark parts grey instead of black.

Length.—16 to 17 inches, wing 7·5 to 7·75, tail 3 to 3·2, bill at front 1·2 to 1·4.

Hab.—Sind, Persia, Afghanistan, Punjab, Oudh, N. W. Provinces, and North Guzerat. A winter visitant to India, arriving in Sind and the Punjab about the last week in October. The Smew is a shy and wary bird, taking to flight with great readiness. Smews are gregarious and are always to be found in flocks of from 10 to 20 or 30, usually in deep water on the Indus and other large rivers. Hume says—"They are difficult to approach. They keep in deep water, far away from any cover, and you can only shoot them from a boat, they can swim faster than any ordinary native boat can be propelled, and are always on the alert." They feed on fish and crustacea chiefly.

Family, PODICIPIDÆ.

Tarsus compressed; primaries short; feet lobed; tail very short, almost wanting; bill slightly curved above at the tip.

Podiceps.—*Latham.*

Bill straight, moderately stout; nostrils oblong, lateral, in a short groove; wings short; tarsus scutellate; hallux bordered by a web.

Podiceps cristatus, *Lin.*; *P. E.* 400, 944; *Gould. B. Eur.* pl. 388; *And. B. Amer.* vii. pl. 479; *Jerd. B. Ind.* iii. p. 821; *Str. F.* i. 142, 265; iv. 31, 203; *Murray, Hdbk., Zool., &c., Sind*, p. 240.—The Crested Grebe.

Head with a long, dark brown or black, silky, erectile crest, standing out behind, divided in two; forehead slightly paler; nape and neck behind brownish black or black seasonally, continued on to the back, and coalescing with the dusky brown of the back; in some specimens the entire head, back of the neck, back, scapulars and wing-coverts are dusky brown, with a greenish lustre; lesser wing-coverts white; primaries dusky brown; secondaries white; tertials like the back; lores, sides of the face and cheeks fulvous white; neck in front, breast, and entire lower parts satin white; sides of the breast and flanks with a rufescent tinge; nude space between bill and eye red or dusky seasonally; collar chestnut above, edged below with black; bill brown above, reddish on the sides and below, the tip white; irides crimson red.

Length:—22 to 22·5 inches, wing 7·25 to 7·5, bill at front 2·37, tarsus 2.

Hab.—Sind, Beloochistan, Persia, Punjab, N. W. Provinces, Oudh, Bengal, Guzerat, Kutch and Kattiawar. Affects the sea coast, also inland lakes, rivers, creeks and ponds, which are covered with reeds and rushes; although their wings are short they fly well, but resort exclusively to diving, in which they are adepts. They feed on fry of fish, crustacea, tadpoles and seeds of aquatic plants. The skin of the breast is an article of commerce as a substitute for fur.

Podiceps nigricollis, *Sund.*; *Edw. B.* pl. 96, 2; *Naum. Vogt.* t. 246; *Gould. B. Europe*, pl. 391; *Str. F.* i. 142, 266; *Murray, Hdbk., Zool., &c., Sind*, p. 241.—The Black-necked Grebe.

"*Male.*—Whole of the top of the head, together with the rest of the upper part, the chin, throat, and neck all round, blackish brown, very glossy on the head; back and wings duller and browner on the neck all round; the chin and throat almost quite black, but a good deal speckled with white; this white speckling extending as a stripe at the sides of the neck behind the ear-coverts; two short thick tufts on either side of the occiput, which, though scarcely noticeable in the dried skin, are erected at pleasure in the live bird; behind the eye for about 1·4 inches, a broad streak of orange and reddish yellow, silky glistening feathers. The inner web of the sixth primary, and almost the whole of the subsequent primaries and secondaries, pure white; tertiaries and wing-coverts unicolorous with the back. The whole breast, abdomen and vent satin white, a little tinged with greyish brown about the vent; tail unicolorous with the back, and on either side of it, and of the tail-coverts a good deal of white appears; sides and flanks mottled with blackish brown, with traces of a rufous or orange striation.

"In full breeding plumage the sides and flanks are very strongly streaked with orange red, and the parts indicated as speckled with white are entirely black; in the winter plumage the colours are duller; the front of the neck is an earthy brown; and the whole of those portions, indicated as speckled with white, are pure white; the orange red tuft behind the eye is entirely wanting.—(*Hume. Str. F.* i. 267.)

"In all the bills were black; the irides vermilion, and the legs and feet greenish plumbeous interiorly, and blackish exteriorly.

"*Length.*—12 to 13 inches, expanse 22·5 to 24·5, wing 5·2 to 5·6, tarsus 2·9 to 3·2, bill at gape 3·6 to 4."

Hab.—Sind and the Mekran Coasts; common about the mouths of the Indus. Whether this species is distinct from *auritus* or not has to be finally settled. In vol. i. *Str. F.* Mr. Hume gives some characters which distinguish *auritus* from this species, and thinks that "it differs in certain details of colouration and in shape of bill sufficient to justify separation."

Podiceps minor, *Linn.; P. Z.* 905; *Gould. B. Eur.* pl. 392. Podiceps phillipensis, *Gm.; Jerd. B. Ind.* iii. p. 822; *Str. F.* i. 268; iv. 203; *Murray, Hdbk., Zool., &c., Sind*, p. 242.—The Little Grebe or Dab-Chick.

Crown of the head and nape dark blackish brown, or sepia brown, glossed with greenish; sides of the face, neck on the sides and in front, chestnut red; chin dull black; breast sepia brown, mixed with white; flanks pale ferruginous; rest of under parts silky white; under wing-coverts buff; primaries pale brown, buffy white basally; secondaries white, margined with brown; back, scapulars and tertials glossy brownish black, with a greenish tinge; bill blackish, paler at the base; irides red brown; legs greenish black or dusky green.

Length.—8 to 9 inches, wing 4, bill at front 0·75, tarsus 1·25.

Hab.—Throughout India, Beloochistan, Persia, Afghanistan, Eastern Turkistan and Nepaul.

Family, PROCELLARIDÆ,—Petrels, &c.

Bill long, straight, compressed, very deeply grooved, tip strong, arched and hooked; nostrils tubular, situated at the base of the bill, and exposed.

Sub-Family, PROCELLARINÆ,—Stormy Petrels.

Nostrils at base of keel, divided by a septum; hind toe generally present; bill slender, compressed; tarsus moderate.

Oceanites.—*Keys and Blas.*

Bill short and slender, curved at the tip; tail forked; wings long, second quill longest; tibia partially naked.

Oceanites oceanica, *Kuhl. Brit. Zool. Proc.* 136 t. 10, 1; *Yarr. B. B.* 2 Ed. iii. fig. p. 639; *Gould. B. Eur.* pl. 65; *Banks and Forst. Draw.* No. 12. Oceanites pelagica, *Wils. Amer. Orn.* pl. 60, 6. Oceanites Wilsoni, *Bp. Journ. Phil.* ix. t. 8, 3. Thalassidroma, *Jerd. B. Ind.* iii. 827; *Str. F.* iii. 375; v. 291; vi. 490; vii. 178; *Murray, Hdbk., Zool., &c., Sind,* p. 242.—WILSON'S PETREL.

General plumage deep sooty brown, or brownish black, blackish on the primaries, tertiaries, occiput, nape and tail; secondary greater-coverts and latest secondaries wood brown or pale hair brown, narrowly margined towards the tips with yellowish white; upper tail-coverts, flanks and bases of some of the external under tail-coverts pure white; a few of the feathers of the lower abdomen narrowly fringed with white; bill dull black; legs and feet polished black, with a conspicuous pale yellow patch in the centre of each web; irides blackish.

Length.—7·12 inches, wing 6·25, tarsus 1·4, bill at front 0·5, from gape 0·7, hind toe obsolete, hind claw just visible as a tiny spur at the base of the tarsus.—(*Hume, Str. F.* v. 291).

Hab.—Sind and Mekran Coasts; also the Ganges and the Bay of Bengal.

Stormy Petrels, vulgarly known to sailors as Mother Carey's chickens, and disliked by them as being foretellers of an approaching storm, have long been celebrated for the wonderful manner by which they traverse the ocean, flying close above the water, or passing over the wavy billows pattering the surface with their webbed feet. Petrels are usually seen in windy or stormy weather, chiefly because "the marine creatures are flung to the surface by the chopping waves, and can be easily picked up as the bird pursues its course." Crustaceans, fish, molluscs and floating algæ are the chief food of Petrels, and it is said they will follow in small flocks under the wake of a ship for the sake of picking up refuse food thrown overboard. On the Mekran and Sind Coasts they are usually met with singly or in pairs flying backwards and forwards just above the surface of the water, as Jerdon justly remarks "much resembling swifts, both in general appearance, colours and flight." They are numerous between Charbar and Pusnee, and beyond the mouths of the Indus on the Kurrachee Coast; Jerdon records this species from the mouth of the Ganges and throughout the Bay of Bengal.

Puffinus, *Briss. Gray, Gen. B.* iii. p. 647.

Bill longer than the head, slender, compressed at the point; lower mandible reflected at the tip; nostrils in a double tube, extending along the upper surface of the bill; tarsus moderate, compressed; toes three in front, rather long; hind toe rudimentary; 1st quill longest.

Puffinus persicus, *Hume, Str. F.* i. 5; v. 292; *Murray, Hdbk., Zool., &c., Sind,* p. 243.—THE PERSIAN SHEAR-WATER.

Female.—The head and nape deep sooty brown, the whole of the rest of the upper parts blackish brown; almost, if not quite, black on the primaries, rump, upper tail-coverts and tail; upper portion of the lores mingled dusky brown and whitish; lower portion of the lores

and the whole of the chin and throat, as far as the eyes on either side, breast, abdomen, vent and shorter central lower tail-coverts, pure white. A white line about 0·06 wide encircles the eye and extends backwards from the posterior angle as a narrow white streak for a distance of 0·35 to 0·4 inch; below this the ear-coverts are dusky brown, slightly mingled with whitish; the white line below the eye is only separated from the white of the throat by a hair line of greyish brown. The sides of the neck and the breast, where the brown of the upper meets the white of the lower parts, are somewhat paler brown, slightly intermingled with white. The sides, axillaries, flanks, and the lesser under wing-coverts next the body, and the whole of the exterior and longer tail-coverts are deep brown; the rest of the lower wing-coverts, except just at the edge of the wing, are white, here and there slightly mottled, especially at the edge of the wing with dusky brown; the longer axillaries are mottled with white along their bases.

Bill dusky brown, bluish at base and basal three-fourths of lower mandible; irides brown; legs and feet white, tinged with pink and lavender, with claws, margin of web, exterior of foot, and outer toe, and part of ridge of mid-toe black.

Length.—13 inches, wing 7, tarsus 1·5, bill from forehead to tip 1·3, from anterior margin of nostril 1·06 inch.—(*Hume, Str. F.* i. p. 5.)

Hab.—Sind Coast and the mouths of the Indus, also on the Mekran Coast. Like the Petrel, the Puffin or Shear-water also lives entirely on the sea, except during the breeding season, when holes in rocks are their haunts; like the Petrels, feeds on floating garbage, fish, crustacea, &c.

Family, LARIDÆ, *Vig.* Lestridæ, *Kaup.*

Bill straight, compressed; wings long and pointed; tail long; tarsi with transverse scutes in front; hind toe usually short.

Sub-Family, STERCORARIINÆ.—*G. R. Gray.*

Base of bill covered with a cere, tip hooked; 1st quill longest; nostrils median.

Stercorarius, *Briss.*—Keel of bill covered with a bony or membranous cere; 1st quill longest.

Stercorarius asiaticus, *Hume, Str. F.* i. 268; v. 294. Lestris parasiticus, *Lin.; Gould. B. Eur.* pl. 441; *Aud. Birds Amer.* vii. pl. 452; *Murray, Hdbk., Zool., &c., Sind,* p. 244.—The Skua.

This is not uncommon off the Manora headland, and along the Sind and Mekran Coasts. There is some difference of opinion in regard to the identity of this bird, under the synonyms given of it above. Mr. Hume, in vol. i. p. 268, refers it to *L. parasiticus,* but in his observations on the species states it may not improbably hereafter turn out that both his specimens and those of Major Tickell's belong to a distinct species intermediate between *pomarinus* and *parasiticus,* in which case he says

it may stand as *Stercorarius asiaticus*, nobis. In vol. v. of the same journal he points out the differences between *L. parasiticus* and his *Stercorarius asiaticus*.

The following is the description of the species from specimens obtained by him at Pusnee on the Mekran Coast :—

"The central tail feathers are manifestly imperfectly developed, one projects 0·75 and the other 0·25 beyond the rest of the tail; the bird is obviously in a state of change of plumage, as the two first primaries in each wing are old, and comparatively pale brown, with conspicuous white shafts only tinged brownish for about 0·5 immediately above the tips, while all the other primaries are new and very dark brown, almost black, with only the basal half of the shafts white, and even that slightly tinged with brown; some of the secondaries, scapulars, coverts and feathers of the back are brown; the same dull pale umber as the first two primaries, and so are two of the tail feathers, while the whole of the rest of the wings and tail are of the same deep blackish brown as the third to the tenth primaries. What is noticeable is, that on the back and scapulars the paler brown feathers have no white tippings, which most probably have worn off, these feathers being the old ones, but all the dark feathers of these parts have narrow brownish white margins. The upper tail-coverts are conspicuously tipped with white, and the longer ones have two very broad slightly rufous or fulvous white bars. The forehead, crown and occiput are dull, pale, wood brown, here and there faintly tinged rufescent, the feathers with pretty broad blackish brown central streaks; the lores are greyish white, the feathers narrowly dark centred; the cheeks, ear-coverts and nape are white, more or less tinged with fulvous or buffy, with very narrow dark brown shaft-stripes; the chin and throat white; the feathers of the base of the neck all round and the breast white, tinged in places fulvous, in places slightly rufescent, with a broad dark brown subterminal transverse band; the sides, flanks and lower tail-coverts are white, with broad brown transverse bars, which in some of the lower tail-coverts have a slight rufescent aureola; the abdomen and vent are white, but on the sides of the abdomen there are faint traces of barrings similar to those of the breast and flanks; the axillaries are broadly barred, with a somewhat greyish brown and greyish white; the tibial feathers pure brown."

Length.—19 inches, expanse 45, tail from vent 6·4, wing 13, bill from front (including cere, which is 0·7) 1·2, bill from gape 2·02, tarsus 1·8, legs and feet dull black, bill brown, cere pale greenish brown, irides brown.

Sub-Family, LARINÆ.—*Bp.*

Bill long, straight above, and slightly curved at the tip.

Gen. **Larus**.—*Lin.*

Bill moderate, strong, compressed, cultrated, bent down at the tip; lower mandible angled beneath; nostrils linear, lateral, longitudinal, pervious; tibia naked; tarsi moderate; toes palmated; hind toe free, short and high on the tarsus; wings long.

Larus cacchinnans, *Pall. Zoogr. Rosso. As.* ii. p. 318. Larus argentatus, *Bp. Icon. F. Ital. Uccel.*; *Hume, Yarkand Exp. Zool.* p. 299; *id. Str. F.* i. 270; vii. 463; *Murray, Hdbk., Zool., &c., Sind*, p. 245. Larus leucophæus, *Licht. Nom. Av. Mus. Berol.* p. 99; *Dresser, B. Eur.* pt. xxii.—THE YELLOW-LEGGED HERRING GULL.

Summer Plumage.—Entire head, neck all round, entire lower parts, upper tail-coverts and tail pure white; round the eye an orange red ring; entire mantle and back, tertiaries and secondaries a delicate pale bluish grey; the tertiaries and secondaries and longer scapulars broadly tipped with white; the earlier secondaries, especially with the major portion of the inner webs, also white; edge of the wing about the carpal joint white; primaries, the first with the whole outer web black, tipped with white and with a broad white band across both webs near the tip; above this band a considerable portion of the inner web is black, and the rest pale grey; second primary similar, but the white band often entirely wanting or reduced to a spot on the inner web only, the black on the inner web of less extent than in the first, and the basal portion of the outer web the same pale blue grey as the coverts and the rest of the wing; the third and following primaries have only the white tips and no white band, the outer webs become more grey as they recede from the second, and the black diminishes on the inner webs proportionally, so that on the seventh or eighth it is generally reduced to a narrow black band across both webs, or in some cases on the outer web only, and in others entirely wanting on the last three quills.

In the winter plumage the nape and back of the neck are striated with pale brown, in some specimens, thinly on the crown also; *legs and feet* lemon yellow.

Length.—23 to 25·75 inches, expanse 58 to 60, wing 16·75 to 18, tarsus 2·5 to 2·78, bill at front 1·9 to 2·35, mid-toe and claw 2·25 to 2·6, bill yellow, red near the tip of the lower mandible in summer. In winter it is dull yellow, whitish at the tip, with a dark spot on both mandibles near the tip, and an orange spot at the tip of the lower one. (*Hume, Str. F.* i. 270. *L. argentatus.*)

Hab.—Sind, Beloochistan (Mekran Coast), Persian Gulf, large rivers of the Punjab, N. W. Provinces, the Delhi District and Rajputana.

Numerous during winter in the Kurrachee harbour. It has not yet been finally settled whether this species is *L. argentatus* or *cacchinnans*. Mr. Howard Saunders (*P. Z. S.* 1878) identifies it with *cacchinnans*; the characters of both species are so similar, that it becomes a vexed question. Mr. Hume maintains it is open to argument. All my specimens agree with Mr. Hume's description; but the length of the mid-toe and claw in 5 out of 6 specimens is 2·25, and of those in the striated plumage the mantle is rather darker.

Larus affinis, *Reinhardt. Vidensk. Meddel.* 1853, p. 78; *et Ibis* 1861, p. 17; *Seebohm and Brown, Ibis*, 1876, p. 452. Larus fuscus, *Jerd. B. Ind.* p. 830, No. 978; *Gould. B. Eur.* pl. 431. Larus occidentalis,

Hume, Str. F. 1873, p. 273; (*nec Aud*); *Murray, Hdbk., Zool., &c., Sind*, p. 246.—THE LESSER HERRING GULL.

Head, crown, neck and nape white in summer, in winter streaked with dusky brown, and with a dusky eye spot; chin, throat and breast white; back dark slaty grey, also the greater and lesser wing-coverts; primaries dark slaty grey, the first six tipped with white, the first with a broad bar and the extreme tip white, the rest only tipped white; secondaries like the back, and tipped with white; some of the tertials also tipped with white; under wing-coverts white; upper and under tail-coverts and tail white.

Length.—Male 24·2 inches, wing 17·2, tarsus 2·6, mid-toe and claw 2·3, bill at front 2·25.

Length.—Female, 22·3 inches, wing 16·8, tarsus 2·6, mid-toe and claw 2·2, bill at front 2·1; bill yellow, the angle on the lower mandible red, irides pale yellow, eyelids yellowish red.

Hab.—Sind, Beloochistan (Mekran Coast) the Coromandel Coast, Kutch, Guzerat, Concan and Deccan.

In immense numbers on the Sind and Mekran Coasts. In the Kurrachee harbour in large flocks, feeding among fishermen when landing their nets and about their huts.

Larus gelastes, *Licht. in Thienem. Fort p. flanz. Vog. Eur.* pt. v. p. 22; *Degl. Orn. Eur.* ii. p. 318; *Bree, B. Eur.* 2nd Ed. v. p. 72; *Blanf. East. Pers.* ii. p. 291. Larus lambruschini, *Bp. Schl. Mus. P. Bas.* p. 28; *Hume, Str. F.* i. p. 274.

Summer Plumage.—Entire head, neck, upper back, rump, upper tail-coverts, entire lower parts and tail white, tinged with rosy, except on the head, where the rosy tinge is scarcely perceptible; mantle, secondaries, tertiaries, lesser and median wing-coverts, and the upper greater coverts, also the wing lining pale bluish French grey, rather pearly grey on the back and tertiaries; four or five of the primary coverts and edge of the wing white; primaries, the first white, except the outer web, tip and margin of the inner web; second to fourth primaries white, the margin of their outer webs narrower and decreasing in extent terminally, and broadening and running up basally on their inner webs, with the black tips broader successively; fifth and sixth primaries tipped white; the outer web of the fifth greyish, and that of the sixth slightly darker, with a subterminal dark band; bill, legs and feet deep red; the bill in some with a blackish tinge; eyelids bright red; irides pale yellow.

Length.—17 to 18·5 inches, wing 11·5 to 12·0, bill at front 1·6 to 1·82, tarsus 2 to 2·12.

Hab.—Sind (Kurrachee harbour) Gulf of Oman, Persian Gulf, the Mediterranean and Black Sea, also the Red Sea.

Numerous everywhere in the Kurrachee harbour during winter. Distinguished from all other species by its never having a hood and the dark spot in front and behind the eye, characteristic of the winter plumage of *ridibundus*.

Larus hemprichi, *Bp.*; *Heugl. Ibis*, 1859, p. 350; *Blanford, Abyssinia*, p. 441; *id. East. Pers.* ii. p. 292; *Hume, Str. F.* i. p. 279; iv. 444; v. 296; *Murray, Hdbk., Zool., &c., Sind*, p. 248.

Summer.—Forehead, crown, nape, chin and throat chocolate brown; neck in front darker, nearly blackish brown, forming a sort of a "bib"; on the upper breast, the edges of the brown of the back of the neck margining the broad white demicollar of the same colour; upper back, scapulars, lesser, median and greater-coverts, also the secondaries and tertials, deep chocolate brown, all the secondaries broadly tipped with white; primaries dark brown, nearly black, all, except the first three, tipped with white; edge of the wing white; breast and sides of the breast paler brown than the back; abdomen, vent, under tail-coverts, flanks, upper-tail and thigh-coverts white; legs and feet yellowish, or greyish yellow; bill greenish drab, tipped red, with a subterminal black bar; irides dark brown.

In winter the forehead and lores are a pale brown, also the crown of the head and cheeks, the feathers here and there margined with greyish white; breast pale brown, the feathers margined greyish white; chin and throat white, the feathers of the latter tipped with brown, otherwise as in the summer plumage, the colour of the mantle and wings being slightly paler.

Length.—17·5 to 18·5 inches, wing 13·25 to 13·7, tarsus 2 to 2·1, bill at front 1·8 to 2·0.

Hab.—Sind, Mekran Coast, Persian Gulf, from the Red Sea to Aden, Kutch, Guzerat, Concan (at Bombay).

Larus brunneicephalus, *Jerdon, Madras Journ.* xii. p. 225; *id. Birds Ind.* iii. p. 832; *Holdsworth, P. Z. S.* 1872, p. 480; *Str. F.* i. 278; iv. 203; vi. 291; *Murray, Hdbk., Zool., &c., Sind*, p. 247.—THE BROWN-HEADED GULL.

Summer Plumage.—Entire head and neck sooty brown, darker where it terminates; orbital feathers white posteriorly; back and wings light grey; nape, hind neck, upper tail-coverts and tail, also the under parts white; first primary black; inner web white at the base and with a white subterminal band, the second has both webs white at the base and a smaller terminal spot, the third is grey, with still less black and no white, and so on, lessening to the seventh; the other quills are grey; bill and feet red, the bill darkish at the tip; irides white.—(*Jerd.*)

Length.—15·8 to 16·5 inches, wing 11·5 to 13·0, tail 4·5 to 5·5.

In winter, the head, neck all round, entire lower parts and upper tail-coverts, also the edge of the wing are white; tail white with a black band, narrowly edged with white terminally; a dark spot before and behind the eye; quills black, white at their bases, and except the first two, all tipped with white; secondaries dark brown, tipped with white; tertials and upper plumage as in the summer.

Hab.—Sind, along the coast and inland, Mekran Coast, Persian Gulf, Bengal, Kutch, Guzerat and the Deccan. Occurs also in Burma and Ceylon.

Larus ichthyætus, *Pall. It.* ii. *App.* No. 27; (*Caspian,*) *id. Zoogr. Rosso. As.* ii. p. 322; *Tristram, Ibis*, 1868, p. 30; (*Palestine*) *Shelley, B. of Egypt*, p. 307; *Dresser, B. Eur.* pt. xviii.; *Str. F.* i. 276; *Murray, Hdbk., Zool., &c., Sind*, p. 247. Kroikocephalus ichthyætus, *Pall.; Jerd. B. Ind.* iii. p. 831.—THE GREAT BLACK-HEADED GULL.

Summer Plumage.—Entire head and upper half of neck black; orbital feathers white; mantle, back, scapulars and wings bluish grey; entire lower parts, tail, and upper tail-coverts white; in immature plumage the tail has a black band; primaries with a black band, increasing in width to the outermost one, which has the whole of the outer web and half of the inner web black; rest of the first primaries grey, tipped with white; bill wax yellow, vermilion red at the tip, with a black bar across both mandibles; the extreme tip orange yellow.

Length.—28·5 to 29 inches, wing 19·0 to 20·0, bill at front 2·6 to 2·7, tail 7·5 to 7·7.

Hab.—Sind and Mekran Coasts, also the larger inland lakes of Sind, Persian Gulf, the Punjab, N. W. Provinces, Bengal, the Concan, Bombay, and South India (Madras).

Larus ridibundus, *Lin. Syst. Nat.* i. p. 225; *Gould. B. Eur.* pl. 425; *Jerd. B. Ind.* iii. p. 832; *Str. F.* i. 278; *Murray, Hdbk., Zool., &c., Sind*, p. 278.—THE LAUGHING GULL.

Head and upper part of the neck all round deep reddish or blackish brown; lower neck, breast, abdomen, vent, under and upper tail-coverts and tail white; mantle, tertials and secondaries pale ashy; four or five lower primary coverts white, the rest pale ashy; primaries white, outer web, except for about an inch of the tip, and edge of the inner web of first primary black; second primary broadly edged on the inner web, and tipped with black on the outer web; at about the terminal third of the quill a narrow black margin about an inch in length; third primary white on the outer web, greyish on the inner, broadly margined and tipped with black, and for about two inches from the tip a margin on the outer web; 4th primary the same; rest pale grey; the fifth, sixth and seventh narrowly tipped with black; the inner primaries and some of the secondaries dark shafted; bill and legs deep red; irides dark brown.

Length.—15·5 to 17 inches, wing 13·0 to 13·5, tail 4·75 to 5·5, bill at front 1·37 to 1·75.

In winter plumage, the head and neck are white, and there is a dark spot in front of the eye and another near the ear-coverts; the primaries too differ in their markings; the first is white, with the outer web black, also the margin of the inner one and the tip, the second is similar, but the black outer web begins from the tip of its covert, and the inner web and tip is margined more broadly with black; the black of the outer web of the third is still less, and it decreases also in the fourth, the inner web of which is greyish instead of white and broadly margined and tipped with black, the rest are greyish with black tips, except the two last, which has besides a small white spot terminally; the first

three primary quills agree well with the plate in *P. Z. S.* 1878, p. 201. Saunders on the *Larinæ*.

Hab.– Sind, in the Kurrachee harbour, and on the inland lakes; the Mekran Coast, Persian Gulf, rivers of the Punjab and Bengal, at Bombay, also the Mediterranean Coast to Egypt, Asia Minor, the Red Sea and Arabian Coast.

Sub-Family, STERNINÆ.—*Bp.*

Bill long or moderate, entire, straight, compressed and pointed; the lower mandible angled; nostrils longitudinal; wing long and pointed; tail short and even; or long and forked; tarsus short and slender; toes short, webbed.

The common residence of this Family is the sea shore, mouths or banks of large rivers and lakes. They are always in large flocks, and especially so in the breeding season.

They continue long on the wing, and are quick in all their evolutions, darting upon their finny prey, rising in the air, or gliding along near the surface of the water. They are commonly divided as Marsh, River, Sea, and Oceanic Terns, according to their habits and structure.

Gen. Gelochelidon.—*Lin.*

Nostrils with plumes reaching the opening; first quill of wing longest; tail forked; tarsus rather long; bill moderate; culmen slightly curved and with a projecting gony or angle.

Gelochelidon nilotica, *Hasselq.*; *Naum. Vog.* t. 249; *Yarr. Br. B.* 2 Ed. iii. fig. 5, 515; *Gould. B. Eur.* pl. 416. Gelochelidon anglicus, *Mont. Jerd. B. Ind.* iii. p. 836, No. 983; *Str. F.* i. 281; *Murray, Hdbk., Zool., &c., Sind*, p. 248.—The Gull-billed Tern.

In summer, forehead, lores, head on the crown, nape and back of the neck silky or deep black; sides of the face, chin, throat, breast and under parts white; mantle, wings and tail light grey, wings reach about two inches beyond the tail; the first primary is rather a hoary grey, the rest light grey, their tips and inner webs next the shaft dusky brown, the margins for their basal two-thirds greyish white; shafts white; secondaries and tertiaries light grey; under wing-coverts white; tail light grey, the feathers white shafted; bill, legs and feet black, the latter with sometimes a reddish tinge; irides dark brown.

Length.—14·5 to 16·2 inches, wing 13 to 14·5 inches, reaching the tail by from 2·0 to 2·7 inches, bill at front 1·5 to 1·7, tarsus 1·5.

In winter, the black head is replaced by a white grey streaked head, and a few dusky spots behind and round the eye.

Hab.—Sind, Beloochistan, Persia, Bengal, Rajputana, Kutch, the Concans and Deccan. Affects the large inland pieces of water; especially numerous on the Munchur Lake in Sind, and the salt water creeks in the deltaic districts. Arrives about the middle of September and leaves about the third week in May.

Gen. **Sterna**.—*Lin.*

Characters the same as *Gelochelidon*. Front toes united by indented web; hind toe short.

Sterna cantiaca, *Gm.; Yarr. Br. B.* 2nd Ed. iii. fig. p. 497; *Gould. B. Eur.* pl. 415; *Str. F.* i. 285; *Murray, Hdbk., Zool., &c., Sind,* p. 248c.

Summer Plumage.—Forehead, crown, back of the neck and nape, occipital crest and ear-coverts glossy black; sides of the face, chin, throat, neck in front and behind, breast and entire lower parts white, tinged with rosy; mantle and wings pale silvery grey; the first primary is slightly darker than the rest, with more than half of the inner webs near the shaft white; the next two or three paler, also the succeeding ones, till they shade away into the colour of the wing-coverts; their inner webs greyish white or white; under wing-coverts white; tail forked, white, the external feathers on each side slightly greyish on their outer webs; upper tail-coverts white.

In winter plumage the whole of the head is white or mottled with white and black, and there is a crescentic narrow black spot in front of the eye; mantle and wings as in the summer plumage. Legs and feet black, also the bill, which is tipped on both mandibles with horny yellow, or yellowish white; irides brown.

Length.—17·5 to 18·0 inches, wing 11·5 to 12·5, tail 6 to 6·2, bill at front 2·0 to 2·4, wing reaches about one inch beyond the tip of the tail. The females are smaller, with a much shorter tail and no rosy tinge.

Hab.—Sind, Beloochistan (Mekran Coast) Persia and Egypt. Its other habitats are in various parts of Europe. Affects the sea coast of Sind and Beloochistan, congregating in large flocks on sand banks or rocks in the Kurrachee harbour.

Sterna media, *Horsf.; Gould. B. Asia,* pl. 25. Sterna bengalensis, *Lesson; Jerd. B. Ind.* iii. p. 842, No. 990; *Str. F.* i. 284; ii. 318; iv. 474; v. 301; *Murray, Hdbk., Zool., &c., Sind,* p. 248c.—The Smaller Sea Tern.

Summer Plumage.—Forehead, crown, nape and back of the neck and occipital crest glossy black; lores, face, sides of the neck, breast and entire lower parts white; mantle and wings light silvery or satin grey, paler on the tail; the outer web of the external feathers greyish white; primaries dusky grey, the inner webs margined with white, and the portion next the shaft dusky; wings extend two inches beyond the end of the tail; inner webs of secondaries white; bill yellow; irides deep brown; legs and feet black.

Length.—15·5 to 16·5 inches, wing 12·2 to 12·25, tail 6 to 6·7, bill at front 2·5, tarsus 1·0 to 1·2.

In winter plumage the entire forehead and lores are pure white, the crown white, the feathers centred dusky; occiput dusky, the feathers slightly margined with white; a spot in front of the eye and a line behind it black.

Hab.—The sea coasts of Sind, Beloochistan, Bengal, Bombay, Madras and Malabar Coast. A maritime species abundant in the Kurrachee harbour, mouths of the Indus, and the tidal creeks.

Sterna caspia, *Pall.; Naum. Vog.* t. 248; *Gould. B. Eur.* pl. 414; *Yarr. Br. B.* 2nd Ed. fig. p. 493; *Str. F.* i. 280, iii. 347, ix. 439, 487; *Murray, Hdbk., Zool., &c., Sind*, p. 248. Sylochelidon caspius, *Lath.; Jerd. B. Ind.* iii. p. 835, No. 982.—THE LARGEST TERN.

Summer Plumage.—Crown of the head, nape and back of the neck and ear-coverts velvet black; chin, throat, face, breast, the neck in front and behind and entire under parts white; mantle, wings and tail pale blue grey or pearl grey; the first five or six primaries slaty grey, their shafts white; under wing-coverts white. In winter the head is white with a few dark feathers on the nape; bill vermilion red, paler towards the tip; irides brown; legs and feet black.

Length.—18·0 to 20·0 inches, wing 16·0 to 17, tail 4·5 to 5·75, bill at front 2·6 to 2·75, tarsus 1·5 to 1·75.

Hab.—Sind, Beloochistan Coast, Persian Gulf, the Punjab, N. W. Provinces and Oudh. Affects the sea coasts, larger rivers, jheels, lakes and other inland pieces of water. Breeds in N. W. Ceylon, where Mr. Parker (*Str. F.* ix. 487) found a colony breeding.

Sterna bergii, *Licht.; Rupp. Atl.* t. 13; *Jerd. Str. F.* i. 284; ii. 318; iv. 474; v. 301; *Murray, Hdbk., Zool., &c., Sind*, p. 249. Thalasseus cristatus, *Stephens; Jerd. B. Ind.* iii. p. 842, No. 989. Sterna velox. *Rupp. Atl.* t. 23.—THE LARGE SEA TERN.

Forehead, lores, sides of the face, neck in front and behind, chin, throat, breast, and all the lower parts white; crown of the head, including the eye, crest and nape glossy black; back, wings and tail dusky grey; inner webs of primaries next the shaft dark brown, the margins white; inner primaries unicolorous silvery or hoary grey, margined with white; secondaries white on their inner webs and tips; bill pale yellow; irides dark brown; legs and feet black.

Length.—17·0 to 18·5 inches, wing 14·0 to 14·6, bill at front 2·6 to 2·8.

Hab.—Coasts of India generally to the Persian Gulf. Occurs commonly in the Kurrachee harbour, along the Mekran Coast and the Persian Gulf. Breeds in the Gulf of Oman, on the Island of Astola, nearly opposite Jask, whence thousands of eggs have been collected during May and June. The eggs are typically broad ovals, strongly pointed towards the small end, but considerably elongated. Varieties are not uncommon. The ground colour varies from white, greenish and pinkish white to pale buff, pale yellowish, and again pale pinkish stone colour to the richest and warmest salmon pink; the markings are of two colours, an intensely deep burnt sienna brown, often quite black in its intensity, and a pale inky purple, which has an appearance of lying beneath the surface of the shell. In some eggs the inky purple markings are almost entirely wanting, in

others more numerous and extensive than the dark ones. In others these dark markings are comparatively thinly sprinkled or dense; again there are some with huge blotches and spots about the larger end. The eggs vary from 2·3 inches to 2·71 in length, and 1·63 to 1·78 in breadth; the average of 2 dozen was 2·45×1·71.

Sterna seena, *Sykes.; Hardw. Ill. Ind. Zool.* pl. 69, 2. Sterna aurantia, *Gray; Jerd. B. Ind.* iii. p. 838, No. 985; *Str. F.* i. 281; *Murray, Hdbk., Zool., &c., Sind*, p. 248a.—THE LARGE RIVER TERN.

Forehead, crown, nape and back of the neck and circle enclosing the eye glossy black; sides of the face, chin and throat white; breast and abdomen pearly greyish white; under tail-coverts white; tail pale grey, the external feathers white; back, secondaries, tertiaries and wing-coverts pale or ashy grey; primaries hoary or silvery grey, the inner webs of the first three light brown, edged with dusky; under wing-coverts white; upper tail-coverts like the back. In winter plumage the head is white, except a circle of black or dusky round the eye and on the ear-coverts; bill bright yellow, tipped dusky; irides brown; legs and feet red.

Length.—15·0 to 16·3 inches, wing 11·0 to 11·5, bill at front 1·5, tarsus 0·56 to 1·0, tail 7·0 to 7·5.

Hab.—Throughout India, also in Beloochistan and Persia. A permanent resident in Sind, affects the rivers and lakes, also jheels. Breeds in June and July.

Sterna hybrida, *Pall.; Naum. Vog.* t. 255; *Yarr. Br. B.* 2nd Ed., iii. fig. p. 512; *Gould. Br. Eur.* pl. 424; *Jerd.* iii. p. 837, No. 984; *Str. F.* iii. 348; iv. 224; vii. 445; *Murray, Hdbk., Zool., &c., Sind*, p. 248a. Sterna leucopareia, *Natterer.* Hydrochelidon indica, *Steph.; Jerd. B. Ind.* iii. p. 837.—THE SMALL MARSH TERN.

Forehead, crown, nape and back of neck glossy black; lores and chin white; throat and breast pale bluish ash; abdomen dusky; under tail-coverts white, also the edge of the wing; mantle, wings, upper tail-coverts and tail bluish ash; external tail feathers white; under wing-coverts white; bill lake red; irides brown; legs and feet dull red.

Length.—11 to 13 inches, wing 8·5 to 9·75, tail 3·75 to 4·5, bill at front 1·5.

Hab.—Throughout India, affecting lakes and the sea coast.

Sterna javanica, *Horsf. P. C.* 434; *Gould. B. of Asia*, pl.; *Jerd. B. Ind.* iii. p. 840, No. 987; *Str. F.* i. 282; iii. 348; vi. 492; *Murray, Hdbk., Zool., &c., Sind*, p. 248a. Sterna acuticauda, *Gray, Ill. Ind. Zool.* pl. 70, 3.—THE BLACK-BELLIED TERN.

Head and nape black; neck behind black; scapulars, tertials and wing-coverts light grey; lores, sides of the face, ear-coverts, chin and throat white; neck in front and breast pearly grey; abdomen, vent and under tail-coverts brownish black.

Bill orange yellow; irides brown; legs vermilion red.

Length.—12 inches, wing 9·3, tail 6, bill at front 1·43, tarsus 1. In winter the head is white with dusky streaks, the abdomen is like the back and not black, and the bill tipped with dusky.

Hab.—Throughout India, except Southern India and Ceylon.

Sterna albigena, *Licht.; Nom. Mus. Berol.* p. 98; *Str. F.* iv. 467; v. 298; *Murray, Hdbk., Zool., &c., Sind*, p. 248a.—THE WHITE-CHEEKED TERN.

The lores and point of the forehead white; the latter with a few black speckles; a patch in front of the eye black speckled with white; the anterior half of the crown white, tinged earthy or brownish grey, and with spots and blotches of brownish black. Feathers immediately above the eye, all the feathers behind it, the sides of the head, occiput and nape, black; the posterior half of the crown blackish brown, a little mingled with greyish white; an imperfect white band from the lores beneath the eyes, with another imperfect black one below it. The back of the neck is whitish, the feathers suffused with grey towards the tips; the whole of the back, scapulars, wings and tail a moderately dark French grey, darker than in *S. bengalensis*, but not so dark as in some specimens of *Bergii*. The upper tail-coverts slightly paler; the wings more silvery, but the outer web of the first primary and of the exterior elongated tail feather much darker; the inner webs of the primaries darker; the first primary with a considerable portion of the inner web white to the margin; the other primaries also, with white on their inner web, but with a grey band on their margin. The second and third tail feathers also a rather darker grey on their outer webs towards the points; the rest of tail feathers, inner and outer webs, pretty well concolorous with the rump and upper tail-coverts; the chin, throat and sides of the neck almost pure white, with only a few faint dusky grey patches; the breast and abdomen a dusky bluish grey, with many large patches of white; the lower tail-coverts greyish white; the wing lining white.

In breeding plumage, according to Heuglin, the upper surface is a full bluish grey; the front and sides of the neck, breast and abdomen, a somewhat paler and more purplish grey; the entire upper surface of head and nape intensely black; the chin and upper part of the throat, the lores, and an oblique band below the eyes, conspicuously snowy white; the beak coral red, blackish towards the base of the culmen and at the tips; the feet bright coral red.

"*Length.*—14·5 inches to 12·5; expanse 29·25 to 29·5; tail from vent 6·5 to 4·1; wing 9·9 to 9·7; tarsus 0·77 to 0·75; bill from gape 2·15, at front 1·55 to 1·47; irides brown; legs and feet Indian red, tinged in front of tarsi and toes with blackish dusky; bill blackish with the extreme tips whitish horny."—*Str. F.* iv. 469.

Occurs along both the Sind and Mekran Coasts, and in the Kurrachee harbour. Mr. Hume (vol. iv. p. 468) in his excellent paper on the birds of "the Laccadives and the West Coast" says—"This species, which he obtained there, had only hitherto been obtained on the coasts

of the Red Sea, northward to about 24° parallel north latitude and southward to the Gulf of Aden there.

Sterna Saundersii, *Hume, Str. F.* vol. iv. 469; v. 326; *Murray, Hdbk., Zool., &c., Sind,* p. 249.—SAUNDERS' LITTLE TERN.

"A triangular frontal patch, the angles reaching to within 0·12 of the eyes, white; a very broad stripe through the lores to the eye black; a narrow white line intervenes between this stripe and the upper mandible. The whole crown, occiput, short occipital crest and sides of occiput as low as the lower margin of the eye velvet black, the central two-thirds of the lower eyelid white, and no black below this; all the rest of the sides of head and neck, chin, throat, entire under parts, wing lining and exterior tail feather, pure white; the first three primaries black with black shafts and broad white margins on their inner webs; their greater coverts dusky black; the whole of the rest of the upper surface, including wings and tail, and excepting parts and feathers already described, a most delicate satin grey contrasting in the strongest manner with the early black primaries.

"*Length.*—9·12 inches, expanse 19·25, tail 3·0, wing 6·43, bill at front 1·12, from gape 1·5, tarsus 0·6, legs and feet dusky yellowish olive, bill yellow, broadly tipped dusky, irides blackish brown."—*Str. F.* v. 326.

This species is extremely common at Kurrachee and along the coast during the latter part of April, also in May and June, in which months it breeds at Kurrachee on the bare plains between Kurrachee and Clifton at Ghizree and on the Moach. The eggs are usually laid in a small depression in the saline soil, the birds selecting wherever possible, spots where there is a little loose shelly sand. Eggs glossless and often chalky, two to three in number, oval and pointed at one end; of a drab, buff, or stone colour, streaked, blotched and spotted, of a dark or deep brown or reddish brown colour generally at the larger end.

Sterna anasthætus, *Scop.; Sonn. Voy.* t. 84; *Jerd. B. Ind.* iii. 844, No. 992; *Str. F.* ii. 320; iv. 474; v. 301; *Murray, Hdbk., Zool., &c., Sind,* p. 248 f. Sterna panayana, *Lath.; Gould. B. As.* vii. p. 33.—THE BROWN-WINGED TERN.

"A frontal band, extending backwards over the eyes for about 0·15 behind the posterior angle of the eye, pure white; a broad black stripe through the lores, to, and behind the eyes joining the black of the occiput; forehead and crown inside the white band and entire occiput and nape velvet black; chin, throat, sides of the neck, axillaries, under wing-coverts, lower tail-coverts, edge of the wing along carpal joint and ulna white; the breast, abdomen and flanks white, shaded with pale French grey; back of the neck the same; back, wings and tail sooty brown; upper back strongly shaded with bluish grey, as are also some of the tail feathers; lesser wing-coverts behind the white edge of the wing blackish brown; the primaries a darker brown; their shafts brown on the upper surface; outer web of first primary almost black; the rest greyish white on their inner

webs, towards their bases; external tail feathers white for the basal half on both webs, greyish brown on the inner web for the terminal half. In winter the entire under surface is pure white, and there is a dark spot in front of the eye; head greyish white or white, the feathers mesially spotted or striped dusky; a black collar at the base of the occiput, extending on each side nearly to the eye.

"Bill dusky reddish, red towards the base of the lower mandible; legs coral red; bill, legs and feet black.

"*Length.*—14·75 inches, wing 9·62, tail 7, bill at front 1·6."—(*Str. F.* iv. 474.)

Hab.—Sind, Beloochistan (Mekran Coast) Persian Gulf, the Concan and the Laccadives.

Sterna fuliginosa, *Gm.*; *Yarr. Br. B.* 3rd Ed. iii. fig. p. 542; *Str. F.* i. p. 440; iv. 477.—THE SOOTY TERN.

Forehead and a streak from the base of the bill to the eye white; sides of the face, chin, throat, neck in front, breast and entire under parts white; top of head, nape, neck behind, back, scapulars and wings sooty black; under wing-coverts white; tail forked, external feathers on each side white on their outer web, rest are white at the base; legs and feet black; irides brown.

Length.—16·5 to 17·5 inches, wing 10·5 to 11·8, tail 6·9 to 7·5, tarsus 0·95 to 1, bill at gape 2·0 to 2·4, bill at front 1·6 to 1·7.

Hab.—Sind, Mekran Coast, Persian Gulf (Bushire) the Concan (Bombay) and the Malabar Coast and Ceylon.

Gen. **Anous**.—*Leach.*

Bill long, slender, slightly curved at the tip, angle well marked; nostrils in a groove; wings long; tarsus short; claw of mid-toe serrated.

Anous stolidus, *Lin.*; *Catesby, Car.* t. 88; *Yarr. Br. B.* 2nd Ed. iii. fig. p. 531; *Jerd. B. Ind.* iii. p. 845, No. 993; *Str. F.* ii. p. 320; iv. 478.—THE NODDY.

A black line from the base of the bill to the eye; forehead white; crown fulvous or yellowish grey; neck, nape, chin, throat, breast, greater and lesser wing-coverts, under wing-coverts, upper and under tail-coverts and tail dark chocolate brown; back and primaries darker, or blackish brown; legs and feet black; irides brown.

Length.—*Male*, 15 inches, wing 11·5, tail 6·5, bill at front 1·6.

Hab.—Sind and Mekran Coast, also the Bay of Bengal, Laccadives and the West Coast.

Sub-Family, RHYNCHOPSINÆ.—*Bp.*

Upper mandible shorter than the lower, and grooved to receive the sharp cutting edge of the lower one; claws long and curved; tail forked.

Rhynchops.—*Linn.*

Characters same as those of the Sub-Family. Hind toe elevated, the tip touching the ground.

Rhynchops albicollis, *Sw.; G. R. Gr. and M. G. B.* pl. 181; *Schl. De. Dier,* fig. p. 292; *Jerd. B. Ind.* iii. p. 847, No. 995; *Str. F.* i. p. 286; vii. 99; *Murray, Hdbk., Zool., &c., Sind,* p. 249.—The Indian Skimmer or Scissor Bill.

Forehead, lores, sides of the face, ear-coverts, chin, throat, neck all round, breast and entire lower parts white; crown of the head, nape, back, lesser and median coverts glossy, sooty blackish brown; lower back and rump and lateral tail feathers white; primaries black; secondaries and tertials tipped with white; bill orange, yellowish at the tip; irides brown; legs and feet bright vermilion.

Length.—16 to 16·5 inches, wing 16, tail 4·75 to 5, bill, upper mandible 2·9 to 3, lower mandible to gape 3·75 to 3·9.

Hab.—Throughout India nearly, on the larger rivers and lakes.

Family, PHÆTONIDÆ.

Sub-Family, PHÆTONINÆ.—*G. R. Gr.*

Bill as long as the head, sharp, and gently curved above, margins finely serrated; two central feathers of tail long and narrow; tarsus short.

Gen. Phæton.—*Lin.*

Characters same as those of the Sub-Family.

Phæton indicus, *Hume, Str. F.* i. 286; iv. 481; v. 302. Phæton æthereus, *Lin. Pl. Eul.* 998.—The Indian Tropic Bird.

"A broad, conspicuous black crescent in front of the eye, and a narrow black line from the gape to nostrils, and nostrils to culmen, dividing the feathers from the bill; the whole forehead, front part of the crown, ear-coverts and entire lower parts, including wing lining and axillaries, pure white; a black line from the posterior angle of the eye, running round the back of the nape, where it forms a more or less conspicuous half collar; hind crown and nape inside the half collar white, each feather with a triangular black bar near the tips; carpal joint of wing, four or five posterior primaries, all the secondaries, the primary coverts, except those of the first five quills, the greater and median coverts pure white; winglet, greater coverts, shafts and outer webs of the first five primaries, together with a narrow stripe along the shaft of the inner web, black; the extreme tips and inner webs of these feathers white; tertiaries and their greater coverts black, narrowly margined on the exterior webs and tipped with white; the lesser secondary coverts similar; the entire back, rump, scapulars, and upper tail-coverts white; closely barred with black, the bars being slightly cuspidate on the upper back, and the longest scapulars almost devoid of barring; tail feathers white, their bases black shafted, and the lateral feather mostly with an arrow-head bar or

spot near the tip; irides deep brown; legs and hallux and its web white, tinged bluish and creamy yellow; rest of feet and claws black.

"*Male.*—*Length*, excluding elongated tail feathers, 16·85 to 17·8 inches, central feathers project beyond the rest of the tail 3 to 5·9, expanse 37 to 39·5, tail from vent, including elongated feathers, 7·5 to 10·3, wing 10·75 to 11·8, bill at front 2·2 to 2·45, tarsus 1·0 to 1·13, mid-toe and claw 1·55 to 1·8. The *Female* 18·05 long, exclusive of elongated feathers, which projected 4 inches beyond the others, expanse 39, tail from vent including elongated feathers 9·0, wing 11·7, bill at front 2·4, tarsus 1."

This is Mr. Hume's description of specimens secured by him in the Gulf of Oman on the Mekran Coast, whether it is the immature of *P. æthereus*, or a new species, is yet a moot question. Captain Butler, in 1877 (*S. F.* v. 302) also secured two specimens on the Mekran Coast between Oormara and Gwadur, and these, Mr. Hume says, are precisely similar to the four specimens secured in the Bay of Bengal.

Family, PELECANIDÆ.—(*Leach.*) *Vigors.* Sulidæ, *Bonap.*

Bill stout, straight, broad at the base, compressed at the tip, edges irregularly serrated; feet webbed; face nude.

Sula cyanops, *Sundev.*; *Phys. Selsk. Tidskr.* 1837, t. 5; *Gould. B. As.* vii. pl. 77; *Str. F.* v. 303, 307; *Murray, Hdbk., Zool., &c., Sind*, p. 248g. Sula melanops, *Hartl. Ibis*, 1860, pl. 2, 3.—The White Booby.

Face to behind the eyes and throat nude; entire head, neck, back, rump, upper tail-coverts and entire lower parts white with a slight fulvous tinge; primaries, secondaries and tertials, also the tail, black; irides lemon yellow; bill horny, blackish at the base; both mandibles denticulated for one-half their length from tip.

Length.—32·5 inches, bill at front 4, gape 4·87, tail from vent 8·0, tarsus 2·25, wing 16·5, legs and feet pale bluish grey.

Hab—Sind and Beloochistan (Mekran Coast) ? Bengal.

Sub-Family, PELECANINÆ.—*Bp.*

Bill long, flattened, compressed and hooked at tip; tail short; lower mandible and throat with a membranous pouch; orbits nude.

Gen. **Pelecanus.**—*Lin.*

Characters those of the Sub-Family. Second quill of wing longest; secondaries nearly as long as the quills; a membranous mandibular and gular pouch.

Pelecanus crispus, *Bruch. Berl. Trans.* 1838, t. 3, 4; *Naum. Vog.* t. 283; *Gould. B. Eur.* pl. 406; *Str. F.* i. 288; vii. 288; *Murray, Hdbk., Zool., &c., Sind.*, p. 248g.

In the adult in spring plumage, excepting the quills, primary coverts and winglet, the whole plumage is white, with more or less of a pearly grey tinge on both the upper and under surfaces according to the light

in which it is looked at; there is a broad band at the base of the neck in front, and at the sides faintly tinged with very pale straw colour; there is not the faintest tinge of rosy anywhere; the whole of the feathers of the head and neck are very narrow, long, soft and silky, much curled and twisted on the head, especially behind and just above the eye; and the feathers of the back of the head are much elongated, so as to form a dense, full crest, some 4·25 inches long; a line of feathers, about 1·5 inches wide down the whole back of the neck, is of a more snowy and less pearly white than the rest of the neck; the scapulars, rump, and upper tail-coverts and median and greater wing-coverts are conspicuously black shafted; and all these, except the longest of the scapulars, are very long and lanceolate. A few of the longest scapulars are broad and round, or mucronate at the end; back, scapulars and tail with a beautiful satiny gloss; the two exterior tail feathers with nearly the whole shafts black and generally with a decided grey tinge on the outer web to near the tip; the rest of the tail-feathers with only the terminal third of the shafts black; primaries (all of which are white at the base) and their coverts and winglet very dark brown, almost black; the second to the fifth primary emarginate on the outer web and silvered with grey on the last above the emargination, which in the second is hidden by the coverts; there is more or less silvering of grey on the outer webs of all the other primaries, their coverts and winglets; the first five primaries are faintly notched on the inner web, and more pale or greyish white on the latter above the notches, while the rest of the primaries have the inner portions of the inner webs white, this is still more conspicuous in the secondaries, most of which have their whole outer webs a silver grey; the tertials are pure white; the feathers of the base of the neck and breast thickly set, very narrow and pointed, the filaments along the margin a good deal separated.

The young bird wants the linear lanceolate feathers. It has the whole head, neck, and upper and lower surface white; the back of the neck more or less shaded with grey; tips of the quills and a row of small coverts near the margin of the wing pale wood brown; the feathers of the head shorter and more fur-like than in the male; crest small; scapulars and shoulder feathers broadly tipped with pale brown, with dark shafts; tail feathers white at the base on both webs; greater part of the rest of the inner web white; primaries and secondaries white at their bases; a large portion of their inner webs white; the rest a darkish brown.

Adult.—Irides white, in the young pale yellow; legs and feet pale plumbeous; edges of upper and lower mandibles for the terminal two-thirds yellowish, and in the young a horny whitey brown, or yellowish grey; the nail orange or pale orange. In the breeding plumage the pouch is a deep orange red, with a black patch on either side, just at the base of the lower mandible; in the non-breeding plumage a dirty primrose, or pale fleshy, tinged with lemon yellow.

Length.—*Male*, 70 to 74·5 inches, expanse 114 to 122, tail 9·5 to 10, wing 26·25 to 29·28; bill at front including nail 15·4 to 16·6. *Females*

smaller; *length* 66 to 68, wing 25 to 28.—(*Str. F.* vii. 448; *Hume, Monag. Pelecanus.*)

Hab.—Sind, Punjab, N. W. Provinces and Oudh, also Beloochistan (Mekran Coast).

Pelecanus javanicus, *Horsf. Lin. Trans.* xiii. 197. Pelecanus onocrotalus, *Pall.* Pelecanus minor, *Rupp. Mus. Senk. Faun. Abys.* pl. 49; *Jerd. B. Ind.* p. 857, No. 1003; *Str. F.* vi. 494; *Murray, Hdbk., Zool., &c., Sind,* p. 248g.—THE LESSER WHITE PELICAN.

Occipital crest small, yellowish white; head, neck, upper and lower surface of body white, with a roseate tinge; primaries dusky; secondaries grey externally; tertiaries white, with broad black margins, internally greyish; tail white; bill blue in the centre, red and yellow on the sides, the tip blood red; lower mandible bluish posteriorly, yellow in front; pouch yellow; irides blood red; legs fleshy pink.

Length.—56 inches, wing 24 to 25, tail 6·5, tarsus 4, mid-toe and claw 4·5, bill 12 to 13 inches.

Hab.—Nearly throughout India.

Pelecanus phillipensis, *Gmel.; Sonn. Voy.* t. 53; *P. Enl.* 965; *Jerd. B. Ind.* iii. p. 858, No. 1004; *Str. F.* vi. 495; *Murray, Hdbk., Zool., &c., Sind,* p. 248 g. Pelecanus rufescens, *Gm.; Rupp. Atl.* t. 21; *Proc. Zool. Socy.* 1868, fig. 4, p. 266, *et* pl. 26.—THE GREY PELICAN.

Head, neck and upper plumage greyish white, the feathers of the head and neck short and fur-like; occipital crest short, the feathers slightly recurved, of a brownish colour and tipped with white; scapulars white at the base, of a grey colour and black shafted; lesser and median coverts like the back; greater coverts grey, black shafted; primaries dusky grey, white at the base; secondaries and tertiaries dusky grey; feathers of the tail grey, black shafted; the basal half or more of the inner webs and shafts white; under tail-coverts greyish white, mottled with brown; under wing-coverts white; bill pale bluish, tinged with fleshy, the tip yellowish; mandibular and gular pouch dusky; the gular pouch with reddish venations and tinged ochreous or yellow; irides pale or dusky brown; legs fleshy.

Length.—60 to 62 inches, being 24 to 25·5, tail 8 to 8·7, tarsus 2·9 to 3·1, bill at front 12·5 to 14·3.

Hab.—Sind, Kutch, Rajputana, Guzerat, Deccan and Bengal, also Southern India.

Sub-Family, GRACULINÆ.

Bill moderately long, straight and hooked at the tip; face partially nude, also the gullet, which is capable of distention; wings moderate; upper and lower tail-coverts short, tail with stiff feathers.

Gen. Graculus.—*Linn.*

Characters the same as those of the Sub-Family.

Graculus carbo, *Lin.; Pl. Enl.* 407; *Str. F.* i. p. 289; *Gould. B. Eur.* pl. 407; *Jerd. B. Ind.* p. 861, No. 1005; *Murray, Hdbk.,*

Zool., &c., Sind. (*Wudda Silli*, Sind; *Pankowa*, Hind.)—THE LARGE CORMORANT.

In summer or breeding plumage, the head and neck are black with white feathers intermixed; nape with a short black erectile crest; lower neck, breast and entire under surface, except a white thigh patch, glossy black; rump, upper tail-coverts and tail black; chin and a fillet of white running up to the eye white, bounded behind by a black band; primaries and their coverts dull black; scapulars, tertials, greater, median and lesser wing-coverts bronze brown, the feathers margined with black; legs and feet black; bill brownish; irides deep or sea-green; facial skin pale greenish; gular pouch yellow, spotted bluish in some.

Length.—32 to 35 inches, wing 13·2 to 14·7, tail 7 to 7·5, bill at front 2·3 to 2·5.

In winter the neck is black; the white feathers and white thigh patch disappear.

Hab.—Sind, North, N.-West, Western and Central India, also Beloochistan and Persia, extending to Eastern Turkistan, Nepaul and Cashmere. Distribution almost universal.

Breeds in Sind in the middle of the Samara Dhund in the Eastern Narra Districts. Nest a platform of sticks, lined with grass and rushes. Eggs 4 to 6 in number, white or greenish white, glossless, and of a chalky texture.

Whether on sea or on the inland lakes, Cormorants make terrible havoc among the fishes inhabiting the waters they affect. Sometimes, though seldom so seen, they swoop down from mid air on the object of their prey, and pursue it under the surface of the water with great dexterity and unerring certainty. They, however, must necessarily rise to the surface to swallow their prey, and this trait no doubt has led to their being trained by fishermen, for the purpose of catching fish. In Sind as well as in China and other countries fishermen always have a dozen or more of these birds sitting, when not employed, lazily on the cross beam of the prow of their boats, quite sullen and stern; the whole deportment of the bird gives it the aspect of an unrelenting tyrant.

In fishing a leathern collar is put round their necks, to prevent the fish being swallowed, and it is said the fishermen in Sind make a livelihood by the amount of fish caught by Cormorants when their nets fail. They are not, however, hooded, as falcons are, when unemployed.

Graculus sinensis, *Shaw, Nat. Misc.* pl. 529; *Jerd. B. Ind.* iii. p. 862, No. 1006; *Str. F.* vii. 178; *Murray, Hdbk., Zool., &c., Sind*, p. 249.—THE LESSER CORMORANT.

Adult Male.—Entire head and neck glossy black; back, scapulars, rump and upper tail-coverts bronze, some of the feathers of the back and wing-coverts margined with black; throat white; cheeks pale brown; entire lower surface black. *No white thigh or cheek patch.* Bill, gular skin and orbits as in the last; irides bluish green; feet black.

Length.—24 to 27 inches, wing 11, tail 6, bill at front 2·25. In the breeding plumage the forehead and sides of the head are speckled with white, there is a white tuft of feathers behind the ears, and the chin is white.

Hab.—Sind, Kutch, Guzerat, Rajputana and the Deccan, also in South India. Breeds in Sind during November.

Graculus javanica, *Horsf.; Pl. Col.* 434; *Gould. B. As.* pl.; *Jerd. B. Ind.* 863, No. 1007. Graculus pygmæus, *Pall. Zoogr.* t. 74, pl.—THE LITTLE CORMORANT.

In Summer Plumage.—A white triangular patch on the head; lores and a line through the eyes white; a few white hair-like feathers on the nape and sides of the neck; chin black; whole body glossy black; head with a short occipital crest; wing-coverts, scapulars, secondaries and tertiaries glossed silvery, the feathers margined with black; bill brownish or purplish brown; gular and orbital skin livid fleshy; legs dusky.

Length.—19 to 20 inches, wing 8·5, tail 5·5, bill at front 1·25, tarsus 1·3.

Hab.—Sind, Punjab, N. W. Provinces, Kutch, Guzerat, Rajputana, Concan and the Deccan. Breeds in Sind during November and December.

Sub-Family, PLOTINÆ.

Bill with edges finely notched; neck longer than the body.

Gen. Plotus.—*Lin.*

Bill long, straight, slender; second and third quills longest; nostrils basal, covered by a shield; tail long and rounded.

Plotus melanogaster, *Penn. Ind. Zool.* pl. 12; *Jerd. B. Ind.* iii. p. 865, No. 1008; *Str. F.* vol. i. p. 469; *Murray, Hdbk., Zool., &c., Sind.*, p. 249. (*Sili*, Sind.)—THE INDIAN SNAKE BIRD.

Head, nape and neck brown, the feathers edged with pale ferruginous; back of the neck slightly darker; chin and throat white, also a line from below the eye to half way down the neck, and a narrow superciliary streak from the base of the bill; back and entire under surface glossy black; primaries, secondaries, tertiaries, scapulars and wing-coverts black, very slightly glossed; some of the inner secondaries, all the wing-coverts, scapulars and tertials mesially white; upper tail-coverts and tail black, the central feathers with barred ridges; under wing-coverts black; legs and feet black; bill dusky on the upper mandible, yellowish on the lower; irides yellow.

Length.—32 to 33 inches, wing 13·2 to 14, tail 8·3 to 9·2, bill at front 3·5.

Hab.—Sind, Bengal, Rajputana, Kutch, Guzerat, Concan and Deccan.

Common in Sind, breeds from June to December. Eggs white or bluish white, with a chalky coat.

CLASS III.—REPTILIA.

Reptiles in Sind are neither numerous nor formidable as far as they have been collected and determined. Of Land Tortoises two species occur, and of the freshwater forms (*Emydidæ*) only a few are known. Probably most of the Gangetic and Punjab forms will be found to occur on closer investigation.

Of the Trionycidæ or Freshwater Turtles, besides the Common Mud Turtle, (*T. Gangeticus,*) three others occur; while *Chelonia virgata* and Caouana olivacea are the only marine forms known to affect the Coast.

The Saurians are represented by the common Crocodile (*C. palustris*) and the Gharial (*G. gangeticus*), while the species representing the Lacertiliadæ are numerous on the sandy ridges and plains. The Varanidæ or family of Water Lizards are nearly all represented.

Among the Lizards the most remarkable is the one known among Europeans as the *Biskobra*, the *Khun* of the Sindees. Numerous deaths are attributed to it, and strangely enough believed in by not a few. Collections of this lizard have been received from various part of Sind and preserved in the Kurrachee Museum, and these are all *Eublepharis macularius et hardwickii.* "Give a dog a bad name and hang him," is an old proverb, and it well applies in the case of the *Khun* or *Biskobra*, the repulsive appearance of these harmless creatures no doubt being the cause. There is, however, some risk attending the careless handling of these lizards, when killed or freshly preserved in spirit. The tubercles with which their bodies are studded contain a very irritant secretion, which, coming in contact with the naked skin of the back of the hand or other part of the body, occasions a numbness followed by a painful swelling of that part, and subsequently a species of *Herpes* which the natives in Sind cure by the application of a poultice made of chalk paste. The Geckoes too have this irritant secretion contained in the tubercles with which their bodies are studded, but in a lesser degree.

The Ophidians are familiar to and recognizable by all. They inhabit either arid or moist localities, trees, &c.; some are entirely acquatic, as the Hydrophidæ or Sea Snakes. All live entirely on animal food, and many, not unlike some of the other orders of the animal kingdom, prey on their kind, as *Bungarus cæruleus* and *Ophiophagus elaps;* (this last does not inhabit Sind). They are oviparous, ovo-viviparous, or viviparous. Many are remarkable for the beauty of their colouring and handsome markings, and although this may be all the eye can desire, the want of knowledge of the innocent species and the potency of the venom of some inspire dread and a general aversion to the whole order.

The popular mode of discriminating poisonous from non-poisonous snakes is very erroneous, as the characters given by some writers for

the purpose are applicable to most of the innocuous species. The broad, flat and lanceolate form of head is not exemplified in the Cobra, nor in the genus *Bungarus*, while the *Callophis* genus is characterized by a short obtuse head and a broad snout. The *Crotalidæ* and *Viperidæ* approach the characters rather closely. Theobald says in the Appendix to his work on the Reptiles of British India, "practically as regards poisonous snakes which are dangerous to man, the question is narrowed to the consideration of a limited number of species, since many from their small size, and others from their rarity, may be disregarded, and hence perhaps the simplest way of learning what are poisonous snakes would be to pass an hour or so in some museum where acquaintance might be made with the commoner or more deadly species." He adds "the rule is absolute and without exception *that every snake possessing a loreal shield* (see Plate on p. 373) *is harmless.*" There are, however, a few exceptions of snakes possessing a loreal shield being also innocuous, but these are otherwise readily known and do not occur in Sind.

The venomous snakes are—(1) The Hydrophidæ, which possess a flattened tail, the whole of which are deadly without exception. Their fangs are small, but their venom extremely potent; next are the vipers possessing tubular, erectile fangs of great length, and then follow the Cobra, the Bungarus and the giant Hamadryas. The Kuppur is the viper of Sind, and is noted for its deadly venom as well as for the great numbers in which it is found throughout the province, inhabiting store-rooms and houses.

Although it is said that the venom of a poisonous snake has no effect on another of the same kind, yet in the case of the bite of a Kuppur it has been proved to the contrary. Dr. Imlach, in his pamphlet on Snake bites in Sind, says of it—"Fierce and aggressive, it is very much dreaded, and numerous deaths are attributed to its bites; even the Cobra, whose poison is as deadly, falls a victim to it. In the society of the Kuppur (*Echis carinata*) the Cobra appears as if fascinated, and even when bitten makes no movement indicative that pain had been felt; still in a few minutes down goes its head and crest (hood), and ere half an hour the reptile that had been capable of dealing death and destruction has succumbed to the poison of one of the same family." Dr. Fayrer says "that the poison of the Kuppur killed a fowl in four minutes, another in two minutes, and a dog in about four hours," and Dr. Imlach "that the poison introduced into the system of a fowl induces death in about three quarters of a minute." Death in a fowl occurs much in the same way as in the human subject; the mucous membrane is powerfully acted on, the head gradually droops, the legs give way, and the creature rolls on its side in the last agony of passing life.

Of the Cobra (*Naja tripudians*) there are three varieties in Sind, and the most common is that known as the black Cobra or *Karo Nag* of the Sindees. This attains a length of from 4 to 5 feet. Being commonly exhibited by snake charmers, its identity is perfect, and notwithstanding the virulence of its poison, very few fatal cases are recorded against it. In fact the popular belief of the Sindees is, that

unless the Cobra is harmed it is itself harmless. Other venomous snakes in Sind are *Daboia Russelli* (Russel's Viper) and *Bungarus cæruleus* (The Krait), whose bites are very justly dreaded.

The effects of the poison of the venomous species, both on man and animals, produce morbid symptoms, differing, however, in the degree or rapidity of action in man. From the numerous experiments on brute animals by able physiologists, and the effects of the remedies employed, which, while in the case of man have proved successful, have been of non-effect in the cases of dogs, &c., it may be safely assumed that the effects of serpent poison are not precisely the same in man and beast; but there can be little doubt that experiments judicially conducted on brute animals would contribute in a great measure towards suggesting hints as to the best mode of treatment and the antidote to be employed.

The degree of danger as Drs. Gunther and Shortt rightly say, and which is confirmed by experiments, "depends but little on the species which has inflicted the wound, but rather on the bulk of the individual, the quantity of poison injected and the situation of the wound, and again upon the frequency with which it has been biting, upon which depends the intensity of the poison." A second consideration is the size and vigour of the person bitten. In regard to Cobra poison, the symptoms it is said are uniform in effect both in man and beast, and usually, if remedies are not applied in time, the case terminates fatally in from half an hour to twelve hours.

The symptoms of Cobra poisoning are said to be a burning sensation or stinging pain in the bitten part, which becomes swollen, red and painful on pressure, a feeling of intoxication, lethargy, partial paralysis, loss of speech and profuse salivation, and often nausea and vomiting. The blood in human beings remains fluid after death, and does not coagulate as in brute animals.

In cases of Daboia bite, the same burning and stinging sensation of pain is felt as in that of Cobra poisoning, but the symptoms begin with convulsions, and there is much dilatation of the pupil, and less salivation, while in Krait or Bungarus poisoning, there is a parallelism in the effect to that of the Cobra.

The virulence of the poison of the Cobra is well known, and to it, the Daboia, the Bungarus and the Kupper, are to be attributed the numerous deaths in Sind, the Punjab and N. W. Provinces. There is no hope of recovery from the bite of any of these, once the poison is thoroughly innoculated into the system, and has entered the circulation. Paralysis of the nerve centres set in and death ensues in a very few minutes. The first consideration then in all cases of snake bite is to prevent the absorption of the poison, by applying effectual ligatures above the wound of any material which would be at hand, such as narrowly twisted cloths, cords, or where it is possible to obtain it, a tourniquet, or an India-rubber band, which is best and less painful. This done, aid could be obtained within the next few hours and the part excised or amputated, as the case would deserve, and remedies applied. Suction of the wound is said to have been effectual in a few cases, but there is risk attending such

a procedure if the person has a sore lip or tongue, and is likely to imperil two lives instead of one. Dr. Shortt in the *Madras Monthly Journal of Medical Science*, March 1870, gives an instance of this in a case in which he himself sucked the wound of a man. He says—"The blood I sucked out of the wound had a very peculiar taste, I felt nothing strange till about a couple of hours after the accident had occurred, when I began to feel a tightness across the gums and roof of the mouth, in the place between the two incisors. This was followed by a sharp stinging pain of a peculiar burning character. I was somewhat restless and uneasy, and shortly after began to feel languid and faint, when, for the first time, it struck me that I might have imbibed some of the poison into my system. I became alarmed and anxious about myself, I had some brandy and water, and felt somewhat better after it; while the pain and uncomfortable feeling in the roof of my mouth continued, and my bowels were inclined to act. I did not give in to the feeling, but resisted it altogether. At 3 P. M. the uncomfortable feeling extended not only to the roof of the mouth, but to the same extent in front of the incisor teeth, to the gums under the upper lip. On retiring to bed as usual I slept soundly that night; but about 4 A. M. next morning I was awakened by an acute burning pain in the roof of the mouth, which continued for a couple of hours, and then left, leaving behind a soreness, not only at the roof of the mouth, but extending to the tongue to the extent of an inch from the tip. This feeling became more acute on attempting to take my usual cup of tea, nor could I taste any curry or other dish prepared with condiments, which did not give me instant pain.

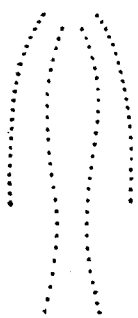
"I believe the sucking out of the poison from the wound was the main cause of saving the man's life, yet, at least five minutes, if not more, must have elapsed between the time the man was bitten and the suction of the wound, and there must have been ample time for some of the poison to have entered the system. The Cobra was fresh and vigorous, and the effect produced in my mouth was the best evidence that ample poison was injected into the wound. I believe the subsequent potash treatment, both internally and externally, in which I solely depended in this case, had its action expedited by the stimulant effect of the brandy, and aided materially in perfecting the cure."

The excision of the part likely to contain the poison is best. Numerous remedies have been suggested and experimented on, but in my opinion there is nothing better than the following recipe properly adminstered when ligatures have been applied in time.

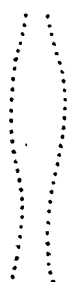
Liquor Potass	m. xxx.
Brandy	oz. iii.
Water	oz. ii.

One-third part to be taken every 10 or 15 minutes according to the urgency of the symptoms. The wound too, after incision or excision, should also be washed with a solution of potass or permaganate of potass. As recommended by Dr. Fayrer "the patient should be allowed to rest or lie down to sleep if he can." The common

practice of walking the patient about when in a lethargic state enhances the risk of death by forced circulation should it happen that the ligature is not properly or effectively applied, and in any case does more harm than good. Dr. Fayrer even goes so far as to recommend the amputation of a limb to save life. "The milk" he says "of a women bitten by a poisonous snake is fatal to the child if allowed the breast." The blood of an animal bitten by a poisonous snake is also a powerful poison introduced into the system of another animal; but apparently not so the flesh, which does not seem affected, and is eaten. It would be well in all cases of snake bite to examine the wound inflicted, and ascertain whether it was from a venomous or non-venomous snake. A wound from a venomous snake would show either one or two large punctures on each side besides smaller ones if it be from a Daboia, Cobra, or Echis, while that of a non-venomous snake would present a series of minute punctures only. The diagrams below, taken from Fayrer's Thanatophidia, well illustrate the direction and nature of the punctures that would be made by wounds from venomous and non-venomous snakes.



Ptyas mucosus.
Innocent.



Cobra.
Naja tripudians.

Viper.
Daboia Russelli.

Much, however, would depend on the seat of the wound, whether all the punctures as illustrated would be present; but the large fang marks of the venomous species are seldom absent.

In the case of the Hydrophidæ or Sea Snakes, another very venomous family, the fang marks would not be very apparent, owing to their fangs being small and differing but little from the other teeth. Their poison, however, is very potent, and on it they depend chiefly for their food, which consists of fish. These are swallowed head foremost and entire. Russell and Cantor have ascertained by direct observation that the Sea Snakes belong to the most poisonous of the whole order. Tortoises, other snakes, and fish have died from their bite in less than an hour, and a man succumbed after four hours. Dr. Fayrer makes mention of two such cases as the last; one in which a fisherman died in an hour and a quarter.

ORDER—CHELONIA.

TORTOISES.

Reptiles with the bones of the thorax united into a solid shield or carapace, which is an osseous structure covered with an epidermoid coat and formed by the more or less complete anchylosis of the vertebræ, ribs, and sternum. Cervical and caudal vertebræ free and moveable. Skull articulated to the atlas by a single condyle. Epidermoid coat soft or horny, divided into horny shields or plates. Head, neck, limbs and tail covered with smooth or tubercular skin. Reproductive organ of male single, lodged within the vesico-genital cloaca, and with a seminal groove only. Oviparous. Eggs coated with a flexible or calcareous shell hatched in the sun under mould or a layer of sand. The order is divided into four families:—Testudinidæ or Land Tortoises, Emydidæ or Freshwater Tortoises, Trionycidæ or Freshwater Turtles, Chelonidæ or Marine Turtles.

Family, TESTUDINIDÆ.

LAND TORTOISES; TERRESTRIAL CHELONIANS.

Herbivorous. Shell or carapace very convex, with horny shields. Thorax and sternum united into an immovable case. Oviparous. Eggs sub-cylindrical, hard-shelled.

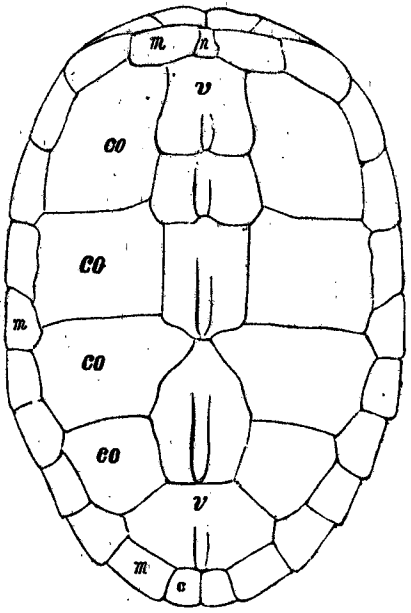
Testudo, *Oppel.*

Thorax and sternum solid, bony; sternum concave in males, flat in females; caudal plate single; gular plates not united. Toes short, not webbed; 5 before, 4 behind. Feet club-shaped.

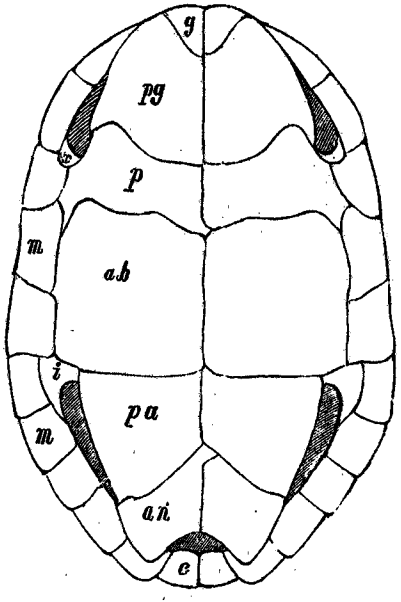
Testudo elegans, *Schœpff. Testudo.* t. xxv. p. 111; *Murray, Hdbk., Zool., &c., Sind,* p. 256. Testudo actinodes, *Bell, Zool. Jour.* 111-419; *Gunth. Rep. Br. Ind.,* iii., p. 419, p. 4; *Theob. Rep. Br. Ind.,* p. 2.—THE STARRED TORTOISE.

Shell oblong-ovate, contracted towards both ends and elevated in the middle, with the lateral margins straight and slightly curved; it is higher than broad, and has a deep broad obtusangular notch anteriorly, and the sternum a similar one, but of less depth, posteriorly. Plates elevated into prominent humps from ½ to 1 inch high. Areolæ of vertebral plates central, of the costals towards the upper margin, and of the marginal plates in the lower posterior corner. No nuchal plate. Areolar portion of the three hinder marginals projecting. Gular plates elongate, triangular, longer than broad. Post-gulars longer than broad. Abdominal as broad as long. Anal plates nearly regularly rhomboidal.

Head covered with small polygonal horny shields, those on the upper portion of the snout and on the crown being symmetrically arranged. An oblong shield above the tympanum. Jaws indistinctly denticulated.



n Nuchal.
v—v Vertebrals.
co Costals.
m—m Marginals.
c. Caudal.



g Gular.
pg Postgular.
p Pectoral.
ab Abdominal.
pa Præanal.
an Anal.
x Axillary.
i Inguinal.

Front part of fore legs and the hinder part of the lower hind legs covered with large, flat triangular scales. A group of large conical turbercles on the hinder side of the thigh. Head and feet yellowish, more or less marbled with brown. Shell black with yellow areolæ, yellow streaks radiate from the areolæ. The streaks on the sternum are broader than those of the upper parts.

Length.—12 to 14 inches. Oviposits in October and November, laying 4 eggs, usually beneath shrubs or tufts of grass.

Hab.—In Sind this species has been found in the vicinity of the Hubb. It has also been found in Kutch and Central India. Dr. Gunther gives other authenticated localities, as Madras, Coromandel, the low jungles of the Carnatic, Pondicherry, Ceylon, and the hilly tracts of Meywar, where Captain Hutton says they are found in the high grassy jungles skirting the base of the hills. According to Blyth it does not occur in Lower Bengal. Gray gives the Himalaya on the authority of Captain Boys.

Testudo Leithi, *Gunth. Pro. Zoo. Soc.* 1869, p. 502, f. 1, 2, 3; *Theob. Rep. Brit. Ind.*, p. 3. Peltastes Leithii, *Gray, Sup. Cat. Sh. Rep. Br. Mus.*, p. 11; *Murr. Zool., &c., Sind*, p. 255.—The Sind Tortoise.

Shell broadly ovate, arched, the convexity of the upper shell stopping at the caudal plate, which is almost flat and forms a convex curve with the last vertebral. Posterior margin of the shell slightly serrated. Plates smooth, but with concentric striæ distinct. Abdominals as long as the gulars, post-gulars and pectorals together. Nuchal plate triangular, pointed in front. Colour yellow, each of the vertebral and costal plates with a black margin in front and on the sides, but not posteriorly. Marginal plates black-margined anteriorly. Sternum truncated in front, with a shallow obtuse-angular incision behind; it is entirely yellow with a broad cuneiform longitudinal black band in the middle of each abdominal plate with its apex behind.

Length.—4·75 to 5 inches.

Hab.—Sind.

Testudo horsfieldi, *Gray.*

The Afghan Tortoise, which is common throughout Beloochistan, in the Bolan, Afghanistan, and Persia, will probably be found to occur in Sind.

Family, EMYDIDÆ.

Fresh Water Tortoises.

Shell convex, more or less depressed, shields horny, caudal shields separate. Toes distinct, webbed. Feet for walking or swimming. Sternum flat in both sexes. Claws 5 before and 4 behind.

Pangshura, *Gray.*

Thorax and sternum solid, bony, united into an immovable carapace. Upper shell angularly elevated, compressed; the fourth vertebral shield

and generally the third also pointed at their junction. Pectorals sub-quadrangular. Caudal divided into two; claws 5 before, 4 behind; feet webbed.

Pangshura tentoria, *Gray, Pro. Zoo. Soc.* 1834, p. 54; *Gunth. Rep. Brit. Ind.*, p. 34; *Theob. Rep. Brit. Ind.*, p. 14; *Murr. Zool., &c. Sind*, p. 255.—THE DURA.

Nuchal plate short, broadish, sub-quadrangular, broadest behind. Vertebrals raised along their median line in a ridge, which is most distinct on the middle of the back, terminating in a nodose prominence on the third and sometimes on the second vertebral. The first vertebral is sub-quadrangular; the second and third are rounded behind and narrowed, longer by half than broad; the fourth cuneiform, tapering anteriorly; the fifth more than twice as broad as the caudals. Caudals much longer than broad, separated by a groove and a very small notch. Hind margin of the upper shell distinctly serrated. Gulars longer than broad, the suture between them being shorter than that between the post-gulars. Pectorals shorter than post-gulars, abdominals or præ-anals. Head covered with undivided skin. Jaws finely denticulated. Upper jaw not emarginate anteriorly. Tail rather shorter than the head. Feet broadly webbed. Front part of the fore leg and base of the fifth toe with large imbricate scales. Colour above, brown with a black vertebral line. Sternal plates blackish brown, margined with yellow. Grows to $8\frac{1}{4}$ inches.

Hab.—The Deccan and the River Indus in Sind; also the Ganges, Kistna, and at Agra.

Pangshura smithii, *Gunth. Cat. Rep. Br. Ind.*, p. 36; *Murr. Zool., &c., Sind*, p. 255. Batagur smithii, *Gray, M. S.; Sup. Cat. Sh. Rep.*, p. 61; *Gunth. Rep. Br. Ind.*, p. 36; *Theob. Rep. Br. Ind.*, p. 15.

Shell ovate, slightly depressed, with a distinct vertebral ridge from the nuchal to the caudal plate, rising into an elongate prominence on the back of the third plate. Sternum flat, its width between the inguinal incisions being rather more than that between the axillary, and rather less than one-half its length. Upper shell slightly serrated posteriorly; nuchal plate small, triangular. The first vertebral is bell-shaped, scarcely longer than broad, and broadest behind; the second sub-quadrangular; the third rectangular, oblong, two-thirds as broad as long; the fourth much elongate, pear-shaped, tapering anteriorly. Gulars considerably longer than broad. The posterior margins of the post-gulars are strongly convex, forming a deep curve. Abdominals nearly as large as post-gulars and pectorals together. Colour above pale yellowish olive; vertebral keel blackish, lower parts black, each plate with yellow margins. Fore legs covered in front with large imbricate scales rather obliquely arranged and with roundish smaller ones between. Hind legs on the outer side with smaller scales, but apparently more horny. Grows to 9 inches.

Hab.—Common in the Indus, extending to the Punjab, where it is found in the Sutlej and Chenab Rivers. Affects the Ganges also.

Batagur, *Gray.*

Thorax and sternum united into a solid case; shell depressed sternum flat in both sexes; pectorals sub-quadrangular; toes broadly webbed, 5 before, 4 behind. Habits, aquatic. Food, vegetable.

Batagur dhongoka, *B. Ham.; Gray, Ill. Ind. Zool.* 11 tab.; *id. Shield, Rept.* p. 36, tab. 18 and 36; *Gunther, Rept. Br. Ind.* p. 42; *Theob. Cat. Rep. Br. Ind.* p. 22.—THE DHONGOKA.

Nuchal plate triangular, broadest behind; vertebrals keeled, the keel terminating on the second and third in a prominent knob; first and second vertebrals longer than broad, also the caudal plates. Gulars as broad as long, the hind margins of the post-gulars form a straight line. Anal quadrangular. Colour dark grey; a yellow line from the nostril to the tympanum. A black vertebral line and two lateral ones.

Length.—18 to 20 inches.

Hab.—The Indus (Sind) the Ganges and Punjab rivers; also N. W. Provinces at Futtehgur and Deccan in Bengal. Theobald gives Central India, Assam and Nepaul.

Batagur baska, *Gray, Sh. Rept.*, p. 35, tab. 16; *Gunth. Rept. Br. Ind.*, p. 37, pl. iii., fig. B.B.; *Murr. Zool., &c. Sind*, p. 255. Tetraonyx baska, *Buch. Ham. MSS. Gray, Ill. Ind. Zool.; Theob. Rept. Br. Ind.*, p. 25; *Dum. and Bib. Erpet.* gen. ii., p. 341.—THE BATAGUR.

Toes four on all feet. Anterior half of shell elevated and convex, posterior much depressed and flattened; the greatest width behind its middle; sternum truncated in front. Carapace smooth and polished. Nuchal plate sub-quadrangular, four anterior vertebrals sub-quadrangular, nearly as broad as long; the fifth hexagonal. Caudal plates square, separated by a suture, without notch behind. Head covered with undivided skin; snout rather pointed; nose turned upwards. Upper jaw denticulated. Colour uniform brown. Grows from 20 to 24 inches.

Hab.—The river Indus; Ganges, Irawaddy, Hooghly, Pegu and Tenasserim. Considered wholesome food.

Batagur thurgi, *Gray, Sup. Cat. Sh. Rep. Br. Mus.*, p. 58; *Murr. Zool., &c., Sind*, p. 255. Cachuga oldhami, *Gray, Pro. Zoo. Soc.* 1869, p. 200. Hardella indi, *Sup. Cat. S. R.*, p. 58; *Theob. Rep. Br. Ind.*, p. 23.

Nuchal plate triangular, broadish posteriorly, shell depressed, with an interrupted median ridge. No costal ridge. Head covered with undivided skin. Upper jaw strongly denticulated with a pair of tooth-like prominences in front. Tail shorter than head. Feet broadly webbed. Fore arm with transverse series of broad short imbricate scales. Toes 5 before, 4 behind. Colour of shell more or less deep brown, or black, the plates of the lower side edged with yellow. A broad yellow band runs from the nostrils over the eyebrows along the side of the neck; a short yellow band anteriorly on each side of the upper jaw. Feet olive, spotted with yellow. Attains to 22 inches.

Hab.—The river Indus, the Ganges, and, according to Cantor, Penang also. Other authenticated localities are Calcutta, Dacca in Bengal and Futtehgur (N. W. Provinces).

Family, TRIONYCIDÆ.

FRESHWATER TURTLES.

Shell much depressed, covered with soft skin, feet strongly webbed, claws 3 on all feet. Carnivorous.

Emyda, *Gray.*

Shell oval, depressed, only partly ossified, covered with soft skin, a more or less broad margin remaining cartilaginous. Sternum united to thorax by cartilage. A broad flexible flap on each side of the posterior sternal lobe. Feet strongly webbed. Claws 3-3.

Emyda granosa, *Schœpff. Test.*, p. 127; *Gunth. Rep. Br. Ind.*, p. 45. Trionyx granosa, *Theob. Rept. Br. Ind.*, p. 32; *Murray, Zool., &c., Sind.*, p. 255; *Gray, Ill. Ind. Zool.*—THE BUNGOMA.

Upper surface of shell and sternal plates granular; the odd osseous plate on the sternum is very small; the plates of the posterior pair rather small, far apart in young specimens, not confluent and only in large individuals forming a suture together. Colour above, pale greenish olive, with yellow spots on the head, neck, and shell, which disappear with age. Hind margin of shell with 6-7, bony granular plates. Grows to 10 inches.

Hab.—The River Indus in Sind, extending into the Punjab and N. W. Provinces. Common in lakes and dhunds. Abundant on the Coromandel Coast, and in lower Bengal. Found also in Sikkim and at Bombay.

Trionyx, *Geoff.*

Shell as in *Emyda*. Sternum sometimes with two pairs of externally visible osseous plates, and with the hinder lobe not dilated into lateral valves. Muzzle produced into a nasal tube. Snout conically pointed.

Trionyx gangeticus, *Cuv. Rep. Anim*; *Murr. Zool., &c., Sind*, p. 256; *Gunth. Rep. Br. Ind.*, p. 47; *Theob. Rep. Br. Ind.*, p. 28. T. hurum, *Gray, Ill. Ind. Zool.*—THE GANGES TURTLE.

Carapace rather longer than broad, with a slight swelling on the vertebral line. The anterior dorsal bone rather short, broad, rugose like the other costal plates, and confluent with the first pair of costals. The small tubercles of the epidermis are arranged in 12 or 13 irregularly interrupted rows. In large individuals the lunate bone of the sternum is granular. Colour variable, light to dark or olive green of various shades, with 2 or 3 pairs of brown ocelli, which disappear with age.

Hab.—The Rivers Indus, Ganges, and tributaries up to Nepaul, also the rivers of the Punjab and the N. W. Provinces.

Family, CHITRIDÆ.

Freshwater Chelonians with 3 claws on all feet, and extremely weak lower jaws. Feet webbed.

Chitra, *Gray.*

Shell depressed with cartilaginous margins. Sternum united to thorax by cartilage. Sternal callosities four. Head elongate. Lower jaw weak. Eyes placed very forward.

Chitra Indica, *Gray, Cat. Sh. Rep.,* p. 70; *Theob. Rep. B. Ind.,* p. 26; *Gunth. Rep. Br. Ind.,* p. 50; *Murr. Zool., &c., Sind,* p. 256.

General aspect of *Trionyx,* but shell more depresed, neck elongate; colour above dark olive brown, lineately marbled or spotted with brown or rust colour.

Hab.—Sind, Punjab, N. W. Provinces and Bengal.

Family, CHELONIDÆ.

MARINE TURTLES.—*Fins in place of feet.*

Caouna, *Gray.*

Fifteen vertebral and costal shields. Fin with one nail.

Caouna olivacea, *Gray, Cat. Sh. Rep.,* p. 73; *Gunth. Rep. Br. Ind.,* p. 52; *Theob. Rep. B. Ind.,* p. 23; *Murr. Zool., &c., Sind,* p. 256.—THE INDIAN LOGGERHEAD.

Marginal shields 27. Vertebral and costal shields non-imbricate; never less than fifteen, but one or two may be subdivided so as to raise the number to twenty. Shields of the back strongly ridged in the young, which are blackish and paler than in the adult. In life the shell and fins of adoloscents are edged with pale yellow, the sternum is pale yellow, tinged with greenish and washed with chestnut. The shell of the adult is blackish or dark greenish, the marginal scales of the fin yellow as in the younger stage. Sternum yellow, washed with chestnut. Oviposits in March and April; eggs 150 to 200, spherical, white.

Hab.—Sind, Malabar and Bombay Coasts, Bengal and South India. Theobald (*Rep. Br. Ind.*) mentions having extracted 206 unshelled eggs from a female which had then deposited 103 mature ones. The flesh is said to be unpalatable, but the Chinese, also the Hindus in Bengal, are said to relish it. This species with the next is common on the Sind Coast, and has been found on the Malabar and Penang Coasts also.

Chelonia, *Fleming.*

Thirteen vertebral and costal shields.

Chelonia virgata, *Schw.*—THE INDIAN TURTLE.

Distinguished from the last by having one pair less of costal shields.

Hab.—The Sind Coast and the Bay of Bengal. Deposits its eggs at Clifton and Ghizree at Kurrachee, great quantities being daily brought in for sale during the season. The flesh is eaten by the natives. According to Sir Emerson Tennent it is said to be occasionally poisonous.

ORDER—SAURIA.

LIZARDS.

Scaled reptiles usually possessing eyelids and four external limbs. Jaws toothed; the rami of lower jaw united in front by a bony suture. Limbs and eyelids never both absent. Oviparous or ovoviviparous.

Emydosauria.—WATER SAURIANS.

Body cuirassed with osseous plates. Vent longitudinal. Oviparous. Tongue, short, flat, immovable.

Family, CROCODILIDÆ.

CROCODILES.

Head with the snout produced, body depressed, covered above and below with square shields arranged in longitudinal and transverse series; tail compressed, elongate. Feet short, more or less webbed. Teeth unequal, strong, conical, acute, in a single series and embedded in sockets. Toes 5—4. Claws 3 on all feet. Hind feet with an external ridge of scales.

Crocodiles are found between the tropics wherever the country is watered by sufficiently large rivers or lakes.

According to Cantor, the Indian species also inhabit the sea coast, and in calm weather may be seen floating at a distance of two or three miles from shore. Those inhabiting inland waters which are dried up during a drought are compelled to wander about in search of water. They do this during the night. Some, however, bury themselves in the mud and remain in a state of torpor, till better times come. Dr. Gunther further adds, that a man seized by a crocodile has only one way of saving his life, if not his limb, namely, to force his fingers into the eyes of the beast, which immediately lets go its victim.

Crocodilus, *Cuv.*

The fourth tooth of the lower jaw fits into a notch in the upper jaw. Snout moderately long.

Crocodilus palustris, *Less. in Belang. Voy. Ind. Orient. Zool. Rept.*, p. 305; *Gunth. Cat. Rep. Br. Ind.*, p. 61; *Theob. Cat. Rep. Br. Ind.*, p. 36.—THE MARSH CROCODILE.

Upper surface of snout covered with numerous small irregular prominences; inter-orbital space deeply concave. Two pairs of keeled anterior nuchal plates; three pairs of large posterior ones, all strongly

keeled. Sixteen transverse rows of strongly keeled dorsal plates. Colour pale or greenish olive, conspicuously black spotted. Grows to 30 feet; individuals 15 feet in length are not uncommon.

Hab.—Found throughout India and Ceylon. This is the species so religiously cared for at Muggur Peer. Affects marshes, lakes, rivers, estuaries and the sea coast. Eggs white, cylindrical, hard-shelled; 3·25 inches ×1·5 in diameter.

Gavialis, *Geoff.*

Snout very long and slender; teeth slender, sharp; food, fish and turtles.

Gavialis gangeticus, *Gmel. Syst. Nat.* i., p. 1057; *Gunth. Rep. Br. Ind.*, p. 63; *Theob. Rep. Br. Ind.*, p. 37; *Murr. Zool., &c., Sind*, p. 256.—The Gavial.

Dorsal shields in six rows in the middle of the back. Adult males have a large hollow prominence at the end of the snout, in which the nostrils are placed. Grows to 20 feet.

Hab.—Found in the Indus, N. W. Provinces, Bengal and Ganges river.

Family, VARANIDÆ.

Water Lizards or Monitors.

Head with the snout produced, pyramidal, covered with small scale-like, but not imbricate, shields. Teeth acute, compressed. Tongue elongate, slender, terminating in a long fork, retractile into a sheath at its base. Scales small, equal on the sides and on the back and arranged in cross bands. Toes five. Claws on all feet. Tail long, generally compressed.

Varanus, *Merrem.*

Nostrils in an oblique slit, situated in, or nearly in the middle between the eye and the extremity of the snout. Scales elliptic, small, those on the back and on the sides not imbricate, each being surrounded by a small circular, granular fold. Tail vertically compressed, with a crest of keeled scales. Throat with a transverse fold. All the species of the genus live on snakes, smaller lizards, toads, frogs, &c.

Varanus flavescens, *Cantor. Mal. Rep.*, p. 28; *Gunth. Rep. Brit. Ind.*, p. 65, pl. ix., fig. A.A. *Theob. Rep. Brit. Ind.*, p. 38; *Murr. Zool. &c., Sind*, p. 256. Monitor flavescens. *Gray, Illust. Ind. Zool.* c tab.—The Short-toed Water Lizard or The Indian Empagusia.

Nostrils nearer the nose than eye. Superciliary scales of unequal size, the outer being smaller than the inner. Scales of the upper parts distant, strongly keeled, *those of the belly smooth, in* 65-70 *transverse series between the gular fold and the loins*. Colour greenish or brownish olive, with irregular dark markings confluent into cross bands on back and tail. Throat with irregular dark transverse bands. Toes comparatively smaller than any of its congeners.

Hab.—Southern and Central India, Concan, Deccan, Kutch, Sind, Beloochistan, Punjab, N. W. Provinces, Bengal, Burmah, Nepaul, Penang and Ceylon. Attains 3–4 feet, the tail being longer than the body.

Varanus dracæna, *Linn.*; *Gunth. Rep. Brit. Ind.*, p. 65, pl. ix. fig. B.B.B.; *Theob. Rep. Brit. Ind.*, p. 38; *Murr. Zool., &c., Sind*, p. 256. Varanus Bengalensis, *D. et B. Erpet.* gen. iii., p. 480. Varanus bibroni, *Blyth, J. A. S. B.* xi., p. 869. *Ghorepore* of the natives of the Deccan; *Gooare*, Hind.; *Goh*, Sind.—THE COMMON INDIAN WATER LIZARD.

Toes of moderate length, armed with strong claws. Nostrils in an oblique slit, midway between the nose and eye. Superciliary scales small without a series of larger ones. Scales of the neck and back without keels, only a little raised in the middle, *those of the belly smooth in* 90 *transverse series between the gular fold and the loin.* Colour brownish olive, black dotted, each dot occupies a scale. These dots are more numerous on the throat. Young specimens marked with numerous small white ocelli edged with darker. Lower parts with irregular dark transverse bands. Nape of the neck with regular cross bands.

Attains to 4 feet, of which the tail is three-fifths.

Hab.—Sind, Punjab, N. W. Provinces, Central and Southern India, Bengal, Concan, Deccan, Ceylon, Burmah and Nepaul; also Beloochistan, Afghanistan. The Iguana of the Europeans.

Dr. Kelaart (*Prod. Faun. Ceyl.*) says "that the natives are partial to its flesh"; and adds:—"We have once tasted some excellent soup made from a tender iguana, it tasted not unlike hare soup." Natives of the Deccan and Sind are also partial to its flesh, and esteem it a specific for rheumatism. Its blood drunk fresh or applied to the loins is considered a cure for lumbago, and is also said to be a good aphrodisiac. Of the skin native tambourines are made.

Varanus lunatus, *Gray, Lizards*, p. 10; *Gunth. Rep. Brit. Ind.* p. 66, pl. ix. fig. 6; *Theob. Rept. Brit. Ind.* p. 38; *Murray, Zool., &c., Sind*, p. 256.—THE BANDED WATER LIZARD.

This species is very similar to *V. dracœna*, from which it is distinguished by the following characters:—A larger number of ventral shields, which are *arranged in* 105 *cross series from the gular fold to the loin;* neck, tail and trunk marked with cross bands, the first formed by a dark streak from either eye meeting on the neck, the angle being directed backwards on neck and forwards on the body; four on neck and eleven on the trunk; sides and legs yellow dotted.

Hab.—Sind, Punjab, N. W. Provinces (Futtehgur and Agra) Oudh, Bengal and Kutch.

Psammosaurus, *Fitz.*

Tail rounded and without a keel. Other characters as in *Varanus.*

Psammosaurus scincus, *Gray, Ann. Nat. Hist.* i. 392; *Murray, Zool., &c., Sind*, p. 257. Varanus scincus, *Merr. Tent.* 59. Varanus

ornatus, *Carleyle, J. A. S. B.* 1869, p. 192; *Theob. Rep. Brit. Ind.* p. 40.—THE OUARAN.

Nostrils ovate, oblique, nearer the eye than nose; superciliary scales small and granular; scales of the neck and back keeled; of the belly smooth, slightly raised in the centre. Tail unarmed, rounded, not keeled; sides convex; scales in 116 transverse rows; colour olive green or greenish ashy, passing on the neck into orange; crown of head black, with lines of the same colour below and behind the eyes and down the neck; a median black line along the nape, and some other less distinct lines and dashes on nose, neck and shoulders; below white; tail slightly more than half the total length. Grows to 30 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Beloochistan, Persia and Kutch.

Family, LACERTIDÆ.

LAND LIZARDS.

Head covered with symmetrically arranged shields; tongue slender, free, exsertile, tip forked; scales on back granular or rhombic, of the sides granular, of the belly quadrangular, or rounded; in transverse bands. No longitudinal fold, but generally one across the throat. Tail fragile, long, rounded, with the scales arranged in rings; eyes diurnal, eyelids present; tympanum distinct; limbs four.

Cabrita, *Gray.*

Nostrils on the ridge of the snout between an upper and a lower nasal plate, both being rather swollen; a small hinder nasal; upper eyelid short, lower large, with a transparent disc; collar none, but a small fold present before each shoulder; scales of the back rhomboidal, keeled, imbricate; ventral scales four-sided, smooth, longitudinally arranged; præ-anal shield single, surrounded by smaller ones; femoral pores distinct; toes 5—5, keeled beneath, not toothed on the sides.

Cabrita leschenaulti, *M. Edw. Ann. Sc. Nat.* xvi. pp. 80-86; *Gray, Cat. Liz. Brit. Mus.* p. 43; *Gunth. Rep. Brit. India*, p. 71; *Theob. Rep. Brit. Ind.* p. 41; *Murray, Zool., &c., Sind*, p. 258. Calosaura leschenaulti, *D. et B. Erpet.* gen. v. p. 262. Cabrita brunnea, *Gray, Ann. Nat. Hist.* i. p. 282.—THE CABRITE.

Shields of the head longitudinally rugose, with partially raised margins. Rostral triangular, broader than high, separated from the single præ-frontal by the supra-nasals, which are in contact with each other. Præ-frontal triangular behind, separated from the vertical by the post-frontals, which are in contact with each other. Vertical elongate, obtusely sub-triangular in front, three-sided posteriorly. Two pairs of occipitals; anterior occipital sub-pentagonal; inter-occipital triangular in front, obtusely rounded posteriorly, with a small shield following; upper labials 8, the fifth very large, and under the eye. Mental large; 5 pairs of chin shields behind it, three of which only are in contact; nostrils between the first upper labial, post-nasal, and two small shields;

temples with small hexagonal, keeled scales. Superciliaries 2, with a series of 7—8 small scales between them, and two long shields above the orbit. Ventral shields in six longitudinal and 25—26 transverse series. Femoral pores 7—8 on each thigh. Tail covered with keeled imbricate scales. Colour olive brown, with two broad white streaks on each side, the upper from the superciliary and running along the side of the back, the lower from below the eye and ear, along the middle of the side to the axil of the hind limb.

Length.—5 to 6 inches.

Hab.—Sind, Punjab, N. W. Provinces, Afghanistan, Rajputana, Kutch, Central India, South India, and Coromandel Coast. Common at Dorbajee on stony ground.

Acanthodactylus, *Fitzinger.*

Nostrils between three shields, the lower of which is the first labial. Eyelids present. A scaly fold across the throat. Ventral scales four-sided. Femoral pores present; toes 5—5, keeled beneath, and toothed on the sides.

Acanthodactylus cantoris, *Gunther, Rep. Brit. Ind.* p. 73; *Theob. Rep. Brit. Ind.* p. 42; *Stol. J. A. S. B.* 1872, xli. pt. 2, p. 91; *Murray, Hdbk., Zool., &c., Sind.*—CANTOR'S SPINED-FOOT.

Rostral shield bent backwards on the upper surface of the snout, with an obtuse angle behind. Supra-nasals contiguous; pre-frontal nearly square; posterior frontals longer than broad, obtusely keeled; superciliaries three (the anterior one small) separated from the orbital margin by small scales; two pairs of occipitals, the anterior pair small, triangular, the posterior twice as large and sub-quadrangular; a very small central occipital is also present; eight upper labials, infra-orbital shield resting on the fifth, sixth and seventh labials; mental shield nearly as long as broad. Chin shields five pairs, the first three only in contact; scales on the back strongly keeled, imbricate, and in 13 longitudinal rows, the keels forming continuous lines; scales on the sides of the trunk keeled, much smaller than those of the back; ventral scales smooth, square, variable in number (10 to 16 longitudinal rows) commonly twelve; scales of the tail keeled; femoral pores 20 on each thigh (varies from 16 or 17 to 21); the fore limb extend to the front edge of the orbit if laid forward; the hind limb to the collar. Hind toes serrated along their external margins; colour greenish olive above, with reticulated blackish lines, uniform white below.

Length.—7 to 9 inches, of which the tail is about two-thirds.

Hab.—Sind, in sandy places, especially on the ridges of blown sand, also Punjab, N. W. Provinces, Beloochistan, Southern Afghanistan and S. E. Persia.

Acanthodactylus micropholis, *Blf. Ann. and Mag. Nat. Hist.* July 1874, xiv. p. 33; *Eastern Persia*, p. 383, pl. xxi. fig. 2.

Rostral moderate, obtusely triangular behind. Præ-frontal single, hexagonal, separated from the rostral by the supra-nasals; nostrils

between the supra-nasal; the first upper labial, and a shield in front of the loreals. Post-frontals, each about the size of the single præ-frontal, and broadly in contact with each other above its apex. Vertical nearly twice the length of its greatest width, grooved mesially in front, where it is rounded and forms a suture with the post-frontals. Post-occipital twice the size of the præ-occipital; inter-occipital very small, three-sided in front; three shields above each side of each post-occipital, the middle one trihedral and about six times the length of the small hind one; temporal region covered with granular scales, the upper and smaller series convex, the lower and larger series faintly keeled. An elongate scale placed obliquely in front of the ear above; ear opening with 2-4 projecting scales forming a serrated edge. Upper labials 7, the infra-orbital shield resting on the fourth and fifth, or falling inside the labial margin between them; lower labials six; five pairs of chin shields along the edges of the labials, the first three pairs only in contact mesially; scales of the back small, sub-imbricate, semi-oval, obtuse behind and distinctly carinate, those between the post-occipital and fore limb smaller, granular, and faintly keeled, as also are those between the axils of the fore and hind limbs on the lower part of the back, they gradually increase in size towards the tail, the keel forming continuous lines. Scales on the tail three or four times the length of those on the back, all strongly keeled and arranged in verticels. The number of scales round the middle of the body, not including the ventral plates, is 50-53. Ventral plates 10-12. Femoral pores 23-27 on each thigh; præ-anals larger than the adjoining scales; body and tail elongate; tail twice the length of the head and body; the fore leg laid forward reaches the end of the snout generally. The hind leg laid forward reaches to the eye, and often to just beyond the ear. Colour, a grey brown on the head, darker on the body, five white lines down the back and an indistinct one on the sides, between the axils of the fore and hind limbs. The three dorsal series coalesce below the hind limbs, and the two laterals on the tail, where they become indistinct. Legs with irregular blotches of white, the dark ground showing a reticulated pattern.

Length 7·8 inches to 8·12, tail from 4·0 to 4·85.

Hab.—Sind (Kurrachee) Beloochistan, Persia, Afghanistan. Found consorting usually wtth *A. cantoris*. Habits similar.

Mesalina, *Gray*.

Nostril on the ridge between three swollen shields, the lower and anterior moderate, hinder upper small, triangular. Collar indistinct, sub-angular, attached in the middle, free on the side. No fold under the ears. Toes five on all feet. Præ-anal single, with one or two series of small scales round it. Scales of the back rhombic or circular, not imbricate; of the belly smooth, contracted behind, arranged in oblique rows (longitudinal, *Blanford*).

Mesalina Watsonana, *Stol. P. A. S. B.* 1872, p. 86; *Theob. Cat. Rept. Brit. Ind.* p. 43. M. brevirostris, *Blf. Ann. and Mag. Nat. Hist.* July 1874, xiv. p. 32.—WATSON'S MESALINA.

Nostrils between three swollen shields, the lower as long as the first loreal. Præ-frontal single, hexagonal, separated from the vertical by the post-frontals, which are in contact with each other, their hind lateral points touching the front point of the superciliaries on each side. Vertical elongate, broader in front than behind and obtusely rounded. Superciliaries two, margined externally with granular scales, the first of these large and sub-triangular; hind superciliary separated from the post-occipital on each side by a group of granular scales. Occipitals five, the anterior pentagonal, the posterior triangular and separated by a small shield. Two loreals; the first very narrow, the last larger, and triangular; 9-10 upper labials, the fifth and sixth largest and beneath the orbit. Lower labials 7-9, the fifth and sixth largest and followed by much smaller shields. Five pair of chin shields, the fourth largest. Ear spacious, margined above, in front with a long narrow shield; scales on the body granular, in about 43-45 rows in the middle of the body; on the upper side of the limbs slightly keeled; on the tail enlarged, verticillate and sharply keeled. Shields of the belly enlarged, trapezoid in 8 rows. Femoral pores 12-15 on each thigh, separated in the præ-anal region; lower eyelid with a transparent disc, granular, with some enlarged flat shields in the centre. Shoulder fold well developed. Colour brownish olive, with four alternating rows of white spots with some blackish ones down the back, and one or two rows down the sides tending to form bands. A dark stripe behind the thigh and dark marks on the tail. Below greenish white.

Length.—6·50 (tail 2·10).

Hab.—Sind.

Mesalina pardalis, *Licht.; Gray, Cat. Liz. Brit. Mus.* p. 43; *Blf. Eastern Persia*, p. 377; *D. et B. Erp.* gen. v. p. 312; *Murray, Hdbk., Zool., &c., Sind*, p. 259.—The Dotted Mesalina.

Resembles *Watsonana*. Scales of the abdomen in 28-31 transverse rows. Femoral pores 11-15, commonly 12; 45-50 granular scales round the middle of the back, not including the ventrals, which are in ten longitudinal rows; the hind foot laid forward sometimes reaches the ear, in some specimens barely extends to the shoulder. The fore limb sometimes extends to the end of the muzzle, but usually falls short of it. Rostral broader than high, obtusely triangular behind. Nostrils between three swollen shields which separate the single præ-frontal from the rostral. Two transparent plates on the lower eyelid; inter-occipital plate usually well developed, and forms a suture with the central occipital, separating the post-occipitals from each other, but occasionally the inter-occipital is very minute and not sufficiently produced in front to meet the central occipital, or there may be another small plate interposed between the two. Colour dark slaty grey above, with small black spots, often edged on one or both sides by white. Lower parts white with a yellowish tinge.—*Blanford.*

Hab.—Sind, Beloochistan, Persia and S. Afghanistan. The more desert tracts in the vicinity of the Hubb, in Sind. Mr. Blanford says—

"It appears to occur throughout Persia to far east in Beloochistan, and was common near Gwadur and S. W. Persia." It occurs also commonly throughout the Bolan and S. Afghanistan, whence I collected specimens.

Family, SCINCIDÆ.

SKINKS.

Head covered with symmetrical shields. Tongue free, exsertile, bilobed at the tip. Scales of the back rounded, quincuncial, imbricate; of the belly and sides similar. No gular or lateral fold. No femoral or inguinal pores. Tail rounded, fragile.

Euprepes, *Wagler.*

Each scale with several keels. Tail rounded and without spines. Nostrils in a single small shield. Limbs four, each with 5 toes. Palatal notch placed far behind.

Euprepes carinatus, *Schn.* E. rufescens, *Cantor Cat. Mal. Rep.; Gunth. Rep. Brit. Ind.* p. 79; *Theob. Cat. Rep. Brit. Ind.* p. 49; *Murray, Hdbk., Zool., &c., Sind,* p. 257.—THE COMMON INDIAN SKINK.

A pair of supra-nasal shields; scales three, sometimes five, keeled in 28 to 30 longitudinal and about 30 transverse series; the præ-frontal is generally separated from the rostral and vertical by the supra-nasals and post-frontals, but sometimes touches one of them. Fifth upper labial below the orbit much longer than high. Colour variable, rich olive brown or bronze, darker on the sides, and with a pale lateral stripe from over the eye down each side of the back. This lateral stripe is often white spotted, or of a very pronounced yellow, and seasonally the sides are suffused with red. Back often streaked or dotted blackish.

Length.—13 to 20 inches.

Hab.—Sind, Punjab, N. W. Provinces, Bengal, Central and Southern India, the Deccan, Ceylon, Arracan, Berars, Nepaul, Penang, &c., and Afghanistan. Very widely spread. Gunther says—"It occurs in almost every part of the Continent as well as of the Archipelago, from Afghanistan to China and to the Phillipine Islands." It is even said to inhabit the Sandwich Islands. Cantor says—"It is exceedingly numerous in the hills and valleys of the Malayan countries. They may be seen basking in the sun, in bamboo hedges or on trees. The female deposits 6 to 12 yellowish white, oval, cylindrical eggs, half an inch in length."

Euprepes macularius, *Blyth, J. A. S. B.* 1853, p. 652; *Gunther, Reptiles Br. Ind.* p. 81; *Theob. Cat. Rept. Br. Ind.* p. 49. E. rufescens, *Shaw apud Cantor.*—THE SPOTTED EUPREPES.

Rostral longer than high; a pair of supra-nasals not contiguous; præ-frontal quadrangular, its anterior and posterior points touching the rostral and vertical; post-frontals separated from each other by the hind angles of the præ-frontal and triangular front of the vertical; they are each about half the size of the præ-frontal, and form sutures with the post-nasal, first superciliary shield and loreal. Vertical elongate,

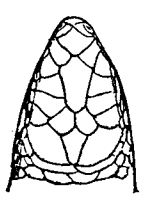
truncated behind, its point extending as far as a line drawn across the sutures of the 2nd and 3rd superciliary shields, and in contact with the anterior occipitals, which form a sub-triangular hollow to receive it. A similar hollow behind the anterior occipitals receives the sub-triangular front of the inter-occipital. Post-occipitals form sutures with the hind lateral angles of the anterior occipitals, first superciliary shield, and the sides of the inter-occipital, but does not meet at its apex. Mental longer than broad, with a large chin shield stretching across behind it, followed by two others on each side along the edges of the lower labials; a groove between the lower labials and chin shields, extending to the gape. Superciliaries four, bordered laterally by a similar number of elongate plates. Upper and lower eyelids fringed with scaly plates. Lower eyelid semi-transparent. Upper labials seven, the fifth the length of the first three, and under the eye. Lower labials seven. Ear opening moderate, about the size of the sixth upper labial with some small lobules in front. Scales in 30 longitudinal rows, and 28 between the axils; those on the back and tail 5-7 carinate; hind margin of the post-occipitals also carinate. Præ-anal and sub-caudal plates not enlarged. The fore limb laid forward reaches the middle of the ear. Colour olive brown with a greenish tinge, the back with eight irregularly broken up longitudinal dark brown lines, formed by elongate dark spots 2-3 carinations wide in the middle of each scale behind. A black lateral streak from behind the eye, widening between the axils and narrowing on the tail, each scale with a white spot, forming four interrupted longitudinal white lines. Entire under parts white; sides of the neck and half way between the axils suffused with vermilion. Limbs olive brown, with minute white and black spots.

Length.—Head and body 2·5 to 2·75 inches, tail 3·25 to 3·5 inches.

Hab.—Sind (Kurrachee) Rungpore (*Blyth*) Punjab, N. W. Provinces, Oudh, Bengal, Central India, Assam, Kachar, Burmah and the Malayan Peninsula; affects hedges and gardens.

Euprepes septemtæniatus, *Reuss.*; *De. F. Pl.* xxvii. fig. 3; *Blfd. Eastern Pers.* p. 388. E. affinis, *D. F. Viag. in Pers.*—THE SEVEN-STREAKED EUPREPES.

General form much as in *E. carinatus*, except that the tail is much shorter. A pair of supra-nasal shields, which meet in a suture behind the rostral. Post-frontals separate, each about half the size of the single præ-frontal. An elongate central occipital completely separating the post-occipitals from each other. Fifth upper labial largest and under the orbit, two other labials behind it. Lower eyelid with a large transparent disc. Ear opening rather small, circular, with two or three subequal lobules in front. Scales of the back with three very faint keels. Scales of the anterior portion of the back, sides and limbs smooth. 34-38 series of scales round the body; 35-38 between the axils. Præ-anal and sub-caudal shields not enlarged. Limbs moderate.



Euprepes septemtæniatus.

The fore limb laid forward extends to the front of the eye. Colour olive brown, with more or less numerous black spots on the head, back and sides; these tend to form longitudinal bands on the anterior portion of the back, and a broad band produced in front of the eye down each side. Below this is a narrow pale line from the upper labials to above the shoulder, with a more or less dark band beneath it. According to Mr. Blanford this species is viviparous. A large female he captured at Kush-kizard, on being placed in spirit, gave birth to three perfectly formed young, each about 3 inches in length and with an umbilical cord attached to a placenta-like mass. Two others, he says, remained inside the body.

Length.—Of specimen 7·8 inches, of which the tail measured 3·9 inches.

Hab.—Sind and Persia.

Scincus arenaria, *Sp. Nov.* Plate

Rostral broader than high, depressed, spathulate, rounded in front and sharp edged. It is slightly concave posteriorly to receive the convex front of the large single præ-frontal. Supra-nasals widely separated. Nostrils lateral, in the front edge of the nasal and below the sub-quadrangular supra-nasals. The post-frontals are pentagonal, longer than broad, rounded anteriorly and sub-triangular behind. They are broadly joined together and separate the vertical from the præ-frontal, with both of which they are in contact, and their upper outer margins form sutures with the outer margin of the first and about one-third of the second superciliary shield. The vertical is elongate, in length is twice its greatest width, and extends behind to a line drawn across the hind outer edges of the fourth superciliary shields on each side. Its apex is nearly triangular, and behind it are two anterior occipitals, both broadly in contact with each other, behind these the nearly triangular front of the inter-occipital is received. Upper labials 8, one-half of the fifth, and the sixth, and seventh under the eye. Infra-labials 7-8. Superciliary shields 6, the hindmost smallest. Below these there is also a row of shields, 4 in number, the anterior of which is the longest and the length of the three others together. There is a small shield in the corner of the eye anteriorly, immediately below the first superciliary; another 3-4 times its size behind the eye, and a row of 4 shields below the eye, just above, and in suture with the upper labials. Loreals two. Mental small with two shields stretching across the chin behind it, and three pairs of other enlarged shields along the edge of the lower labials, the anterior of which only is in contact with each other. Enlarged scales on the back in 10-12 rows, and 28-30 round the middle of the body. Of all the seven specimens I possess, each scale on the back is mesially streaked with dusky brown and edged yellowish white; those on the middle of the back have darker brown tips. There are 7-10 deep reddish-brown blotches or spots along the sides; from the middle of the neck to above the fore limb they are rather rounded, and between the axils of fore and hind limbs, vertically elongated. Tail conical, pointed, about a third the length of

the head and body. Body angular; præ-anals and sub-caudals enlarged. Toes 5-5, flattish, their edges toothed. The fore leg laid forward reaches to beyond the eye, the hind leg laid forward touches the toes of the fore leg laid back.

Length of my largest specimen $6\frac{1}{4}$, of which the tail is $2\frac{1}{4}$; another 6 inches, with a tail of 2 inches.

Hab.—Sind. Obtained on the Hubb plains.

I have no extended description of any of the four recognized Skinks, except what is contained in Mr. Blanford's paper on Persian Reptiles (*P. Z. S.* 1881, pp. 677-678.) From his remarks under *S. conirostris*, I am inclined to the belief that this species is distinct from any known, except *S. Hemiprichii*, which it may possibly be.

Blepharosteres, *Stolickza.*

Scales smooth. Head shielded much as in *mocoa.* Nostril in a single shield. Eyelid none. Sub-caudals entire.

Blepharosteres grayanus, *Stol. Proc. A. S. Beng.* 1872, p. 74; *Theob. Cat. Rep. Brit. Ind.* p. 61; *Murray, Hdbk., Zool., &c., Sind*, p. 257.

External ear none. Body slender. Snout obtuse. Rostral broader than high; præ-frontal single, hexagonal, in contact with the rostral, post-frontals and vertical; its suture with the vertical separating the post-frontals, which are about half the size of the præ-frontal; vertical sub-quadrangular, its anterior sub-triangular front forming sutures with the post-frontals, and its posterior elongate sides with the first, and part of the second superciliaries, the point touching the præ-occipital; præ-occipital single, concave behind to receive the convex front of the occipital, behind which, the lateral angles of the præ-occipital and last superciliaries, the post-occipitals form sutures. Two rows of small shields round the anterior upper, and posterior edge of the eye. One small post-ocular, followed by a temporal shield. Scales in 18-20 longitudinal rows, and 36-38 transverse rows between fore and hind legs. Seven upper labials, the fifth under the eye. Colour above olive green with a distinct metallic lustre, darker on the sides, where speckled with black, and passing on the belly to greenish white. A silvery black edged band from the superciliary edge to the tail, which is paler with a pink blush. Limbs brown olive, with rows of white spots.

Hab.—Sind. Specimens collected in the verandah of the Frere Hall. Lives in chinks of the stone flags. Found also in N. E. Kutch.

Ablepharus, *Cocteau, Weigman.*

Head sub-quadrangular; nostrils lateral; fronto-parietal plates 2. Eyelids rudimentary, circular. Ears distinct. Legs 4. Toes 5-5, unequal. Præ-anal plates.

Ablepharus brandti, *Strauch, Bull. Acad. St. Pet.* xii. p. 367; *Blf. East. Pers.* p. 391, pl. xxvii. fig. 1, 10. A. pusillus, *Blf. Ann. and*

Mag. Nat. History, July 1874, xiv. p. 33. Blepharosteres agilis, *Stol. P. A. S. B.* 72, p. 126; *Theob. Rep. Br. Ind.* p. 62; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

Rostral twice as broad as high. Nasals lateral, separated by the single hexagonal præ-frontal. Post-frontals small, separated from each other by the front triangular point of the vertical, the lateral angles of which form sutures with the post-frontals, and the hind elongated angle with the first superciliary on each side, the point extending a little beyond the division of the first and second superciliaries, and meeting the front median angle of the occipital. Occipital heart-shaped, its lateral borders in contact with the second and third superciliary shields; the hollow in its broad posterior margin filled by a nearly bell-shaped inter-occipital, which, in all my specimens (8 in number) has a sub-central dusky spot. Post-occipitals rounded behind, meeting above the apex of the inter-occipital; their inner margins form sutures with the outer lateral angles of the occipital and inter-occipital. Loreals two, orbital ring scaly; 3-4 narrow whitish shields between the superciliaries and the orbit; temporals large, the largest in contact with the post-occipital. Upper labials seven, the fifth largest and under the eye; lower labials six. Mental nearly as broad as the rostral; a large shield behind it, also 3-4 pairs of chin shields. Back rather flat, 20 rows of scales round the middle of the body, and 35-36 between the axils of fore and hind limbs. Toes scutate, all clawed, palmar surface of feet granular. A row of enlarged præ-anals. Ear opening small, circular, with 2-3 minute lobules in front. Colour brownish olive above, a narrow whitish line from above the eye on each side, to about the length of the hind limb on the tail; above this in many specimens there is a very narrow dark brown line formed by the upper edge of the scales being tipped that colour; below the white line is another dark brown band extending from the nostrils on each side to nearly the very tip of the tail. Under parts white, with a few small dusky spots on the labials and on the sides of the body. Limbs dusky brown with longitudinal whitish lines extending to the tips of the toes.

Ablepharus Brandti.

Length.—2·75 to 3·12 of the largest specimens I have. Tail 1·87 to 2 inches.

This beautiful little lizard is evidently diurnal in its habits. All the specimens I possess were found during the day in the verandah of the Kurrachee Museum running about after red ants, on which they evidently live, and in no instance were any found, except, as it were, basking in the sun. Mr. Blanford records it from the banks of the Shatel Arab, opposite the town of Bussora, and Dr. Stolickza found it in Kutch.

Eumeces, *Weigman.*

Scales thin, polished, not keeled. Tail rounded, more or less long, with keels or spines. Nostrils in a single shield. Lower eyelid scaly.

Eumeces tæniolatus, *Blyth, J. A. S. B.* 1854, p. 739. Plestiodon scutatus, *Theob. Cat. Rep. As. Soc. Mus.* Mabouia tæniolata, *Blyth; And. P. As. B.* September 1871.

Rostral large, subtriangular, as high as broad, behind which the supra-nasals form a suture. Nasal between the first upper labial, rostral and supra-nasal. Præ-frontal single. Post-frontals form sutures with the præ-frontal and vertical, and laterally with the præ-ocular and loreal. Vertical three times as long as its broadest part, followed by a pair of large shields, within the hollow of the sutures of both of which is a bell-shaped inter-occipital, with, as in *Ablepharus*, a small sub-central dusky spot. Post-occipitals form sutures with the sides of the inter-occipital and meet above it, and also with a large temporal plate and the hindmost superciliary. Upper labials 9-10, the 6th and 7th below the eye. Lower labials 9; mental as broad as the rostral with two shields behind stretching across the chin; three pairs of chin shields, the first only in contact with each other. There is a small scale between the second pair. The third pair distant. Superciliary shield 6-7, the third the largest; one post-ocular, one præocular. Two rows of small scales between the upper labials and the disc of the lower eyelid, which is scaly, and a row of small shields between the superciliaries and the upper eyelid. Scales round the middle of the body in 20-21 rows, the dorsal series about three times the width of those on the sides. Anal shields two, sub-caudals 110-120. Toes scutate, all clawed. Ear opening fringed with 3-4 scales. Colour brownish yellow above and below with three broad dark brown lines down the back, all three lines begin from the rostral, and are spotted yellowish; the spots on the lateral line are formed by every alternate scale being tipped yellow. In spirit the yellow changes to a whitish. Tail of the same colour as the body with dark brown specklings in 48-50 irregular bands.

1. Length 10 inches, of which the tail is 6 inches.
2. „ 10·5 „ „ „ 6·25 „

Hab.—Sind and the Punjab, also Cashmere, commonly seen among hedges in and around gardens during the hottest part of the day.

Family, SEPSIDÆ.

Nostrils in the front edge of a small shield contiguous to the rostral.

Sphenocephalus, *Blyth.*

Limbs four, rudimentary, each with three toes, except in *S. pentadactylus*, which has five. Anterior limbs very small, fitting into a groove. Ears invisible. Lower eyelids semi-transparent.

Sphenocephalus tridactylus, *Blyth, J. A. S. B.* xxii. p. 654; *Gunth. Rept. Br. Ind.* p. 98; *Theo. Rept. Br. Ind.* p. 70; *Blf. East. Persia*, p. 395; *Murray, Hdbk., Zool., &c., Sind*, p. 258.—The Cicigna.

Rostral triangular, as broad as high, and protruding beyond the mental. Nostrils between two shields contiguous to the rostral in its

lower third. Supra-nasals form sutures with the sides of the triangular rostral and meet at its apex. Præ-frontal single, hexagonal, broader than long, with a concave hinder margin, into which fits the obtuse front of the vertical. Post-frontals widely separated, pentagonal, and a little elongated posteriorly, its lowest part forming a suture with the fourth labial. Vertical very large, broadest behind, and emarginated laterally. Occipital inequilaterally pentangular. Post-occipitals obliquely elongated, in contact with the outer margin of the occipital, but not meeting at its apex. Upper labials six, the fifth the largest, and under the eye. One præ-ocular, one loreal or post-nasal, separated by the post-frontals. A small plate between the lower eyelid and the large upper labial. Superciliaries four on each side, the second the largest, and with the first form a suture with the lateral emarginated border of the vertical. Mental small, with a small shield behind, followed by a large inequilateral pentangular one, which is concave anteriorly and receives the first small shield. These are followed by three other enlarged shields on each side, the first of which only forms a suture with the large chin shield.

Form slender, elongate. Body cylindrical, laterally angulated, flat beneath. Tail not quite cylindrical. Body covered with small smooth lustrous scales. Sub-caudals broader than the adjoining scales. Head conical. Ears invisible. Lower eyelid well developed, semi-transparent. Legs rudimentary; feet covered with imbricate scales. Toes all clawed. Scales on the back obscurely marked with 3-4 pale ridged lines. Colour a very pale whitish brown. In two of five specimens there is a distinct dusky streak from each nostril through the eye to the hind margin of the temporal plate. The other three, which are much darker in colour, have only traces of these.

Hab.—Sind, Beloochistan, Persia, Afghanistan and Punjab, commonly known as *Rigmahi* or Sandfish, from its inhabiting large tracts of blown sand, and sandy soil in general. Used in Sind and the Punjab as a specific for rheumatics and pains in the lumbar region.

Gongylus, *Wagler.*

Head conical. Muzzle rounded. Rostral square. Frontal large. No fronto-nasal and fronto-parietal. Supra-nasals contiguous. Toes 5-5, unequal. Tail round, tapering.

Gongylus ocellatus, *Wagler, Syst.* 162; *D. et B. Erp.* gen. v. 616; *Gunther, Liz.* 123. Tiliqua ocellata, *Gray, Ann. Mag. Nat. Hist.* ii. 292. Scincus tiligugu, *Gmel. S. N.* 1073; *Murray, Zool., &c., Sind,* p. 258.—The Tiligugu.

Rostral large, square, with the nostril in its upper hinder edge. Supra-nasals two, contiguous. Frontal large, septangular, widest in its upper third, the first superciliary shield in contact with its upper lateral margin, and a large square inter-nasal on each side in contact with the lower lateral margin. Superciliaries five. Vertical large, widest in its upper third across the hinder edge of the third superciliary shield on each side, its apex deeply hollowed to receive the small

nearly oblong inter-parietal. Post-nasal one. A small shield above the front edge of the eye. A row of six scales between the upper eyelid and superciliary shields, and three shields on each side of and above the fifth upper labial, forming, as it were, a nearly complete scaly ring round the eye. Lower eyelid with a transparent disc, its edge as well as that of the upper eyelid margined with 7-8 scales. Ears distinct. Upper labials 9. Lower labials 6-7; mental wider than the rostral with one large shield behind it, and three others along the edges of the labials on each side, the first of which only is in contact, the others widely separated. The fore foot laid forward reaches the gape. Body sub-cylindrical; 28-30 longitudinal series of scales round its middle. Tail round, tapering; sub-caudals slightly larger than the adjoining scales. Toes scutate, all clawed, the palmar surface of feet covered with sub-imbricate flat scales. Colour, a rich bronze above, with an irregular and broken longitudinal series of white lines down the back to nearly the tip of the tail caused by every alternate or third scale in each series, having a small central white streak, bordered with dark brown. There are about 10 series of these on the back of the head, 15-16 across the middle of the back, and 6-7 on the tail. Entire under parts white or yellowish white.

Length.—8-9 inches, of which the tail is about one-third.

Hab.—Kurrachee and the Persian Gulf.

Family, GECKOTIDÆ.

GECKOES.

Head broad, triangular, depressed. Back and sides generally covered with tubercles or granular scales. Belly covered with rhombic imbricate scales. Tongue thick and short, its basal portion attached to the gullet. Eyelids generally rudimentary, not connivent. Pupil generally erect. Toes generally with apparatus for pneumatic adhesions. Femoral or præ-anal pores in the males only rarely absent. Eggs calcareous, globular.

Ptyodactylus, *Cuv. Wagl.*

Toes slender, dilated at the end, with two diverging series of plates beneath. Body simple. Tail round.—(*Gray, Liz. B. M.* p. 143.)

Ptyodactylus homolepis, *Blanford, Journ. As. Soc. Bengal*, vol. xlv. part ii. 1876, p. 19.

"The general build and appearance of this Gecko are very similar to those of the only other species of the genus, as restricted, *P. hasselquisti*.* General form rather elongate, body round, head broad and high behind, wedge-shaped in front, the region in front of the eyes slightly concave. Limbs elongate; the fore limb nearly reaches the thigh when laid back; laid forward it extends beyond the end of the

* Stellio hasselquisti, *Schneider*; Ptyodactylus hasselquisti, *Dum. et Bibr.* iii. p. 378; P. gecko, *Gray, Cat. Liz. B. M.* p. 151.

snout; the hind limb brought forward comes in front of the shoulder. The only perfect specimen measures rather over 7½ inches, head 1 inch; tail from anus 3·4 or rather less than the head and body. The nostrils are entirely surrounded by swollen scales, usually 3, but sometimes 4 in number, considerably smaller than the anterior labials. Some of these scales separate the nostrils from the rostral and labials. Rostral rectangular, its height rather more than half its breadth, which is more than double that of the adjoining labials. Upper labials on each side about 15-16, mental pentagonal, narrower than the adjoining lower labials, and very much narrower than the rostral; a row of enlarged chin shields along the lower edges of the anterior lower labials. No enlarged or pointed scales on the upper eyelid. The whole upper surface of the head, body, limbs and tail is finely and almost uniformly granular. Scales of the abdomen flat, not imbricate, very little larger than those of the back; those of the chin and throat smaller, except near the lower labials. Scales beneath the tail irregularly polygonal, considerably larger than those of the abdomen, not arranged in longitudinal rows. Tail not verticillate. Lower surface of limbs and soles of feet covered with smooth scales; toes with simple cross plates, except at the extremity, where they are expanded into a double disc, marked beneath with radiating striæ; claws retractile, minute, but present on all toes. No femoral or præ-anal pores.

"Colour (noted on living specimens) light brownish grey with broad transverse wavy bands of lighter and darker shades, alternating on the back, tail and limbs. There are about five darker bands on the back, the cross bands are closer together on the tail; lower parts white." (*Blanford, J. A. S. B.* xlv. pt. ii. 1876, p. 19).

Mr. Blandford adds,—"A few specimens of this new Gecko were brought to me near the Maki Nai in the lower portion of the Kirthur Range, which bounds the province of Sind on the west. The locality whence the types were obtained was in the Mehur division of the Shikarpoor district; this is the second species of the genus as restricted, and the first which has been found in Asia; the other species *P. hasselquistii*, which is found in Egypt, is distinguished from this by having enlarged tubercles on the back, and the nostrils in contact with the first upper labial and rostral."

Hab.—Sind.

Hemidactylus, *Cuvier.*

Fingers and toes dilated, ovate, with a double row of transverse, pneumatically adhesive plates beneath. Sides of the trunk without cutaneous appendage. Toes and claws 5 on each foot. Tail with the lateral edge not serrated.

Hemidactylus cocteaui, *D. et B.* iii. (1836), p. 365; *Cantor Mal. Rept.* p. 23; *Gunth. Rep. Brit. Ind.* p. 109; *Theob. Rep. Brit. Ind.* p. 77; *Murray, Hdbk., Zool., &c., Sind*, p. 259.

Rostral grooved above. Nostrils in its upper hinder edge, surrounded by three scales larger than those on the muzzle. Back uniformly

granular, without tubercles; two tubercles on each side of the sacral region. Tail slightly depressed at the base, verticillate, finely granular above, with an enlarged tubercle on each side of each segment. Subcaudals very wide, 6-7 times the width of the adjoining scales. Thumb well developed, claw on it small. Upper labials 12-14, with a row of enlarged scales along its superior edge; lower labials 11-12. One pair of chin shields in contact with each other behind the triangular mental and first lower labial; there is also an enlarged scale behind it, followed by other smaller in size along the edges of the labials. Scales of the belly in 36 longitudinal rows. Femoral pores 6 to 8 on each thigh, widely separated in the pubic region. Tail often bulged at the base in old females.

Length.—6-9 inches. Colour greenish grey or olive, with 5 transverse undulating dark bands from neck to loins (not always distinct). Tail similarly banded.

Hab.—Sind, Beloochistan, at Quetta, Punjab, N. W. Provinces, Oudh, Bengal, Sikkim, Khasi Hills, Burma, Kutch, Concan, Deccan, Penang and Patna, usually frequents houses and especially old tombs and mosques in Sind.

Hemidactylus Gleadowi, *Sp. Nov.* Plate

10-12 upper and 8-10 lower labials; rostral grooved, broader than high; nostrils between the rostral, first labial and three small scales, the latter scarcely differing in size from those covering the muzzle between the rostral and the middle of the orbits; back of the head and between the eye and ear opening covered with round tubercles; upper eyelids distinct, covered with granular scales. Scales on the muzzle closely packed. Ear opening large. Pupil vertical; one pair of chin shields forming a suture with the mental and first lower labial followed by an enlarged one, and others along the edges of the lower labials; the first four situated immediately between each pair of labials, the rest smaller and irregular, forming at the angle of the mouth five distinct rows of enlarged scales. Chin and throat covered with small scales, each with one or two minute black dots. There are 38-39 scales across the middle of the abdomen. Back covered with granular scales interspersed with keeled or sub-trihedral tubercles, all smaller than the ear opening in size; the dorsal series are distinctly keeled, those on the sides rounded, the last row very small. There are 15-16 irregular rows of tubercles across the middle of the back. The tail is longer than the head and body, verticillate, and dorsally grooved at the base to the 4th verticel; each of the first three or four verticels with 5-4 tubercles on each side; on the posterior half they are two or three in number, and become indistinct towards the tip; the spaces between the tubercles on the tail are covered with 5-6 rows of granular scales. Sub-caudals enlarged, about 54-58 in number. Femoral pores 13 on each thigh, interrupted by a single scale. The fore leg laid forward reaches the anterior edge of the orbit, 7 pairs of plates beneath the toes, the last undivided.

Colour pinkish grey, a greyish white line from the nostril to the eye, bordered by a dark line above and below; three dark lines

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3.

R. Mintern, del et lith.

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1. PRISTURUS RUPRESTRIS 2. HEMIDACTYLUS KARACHIENSIS
3. HEMIDACTYLUS GLEADOWI

radiating from behind the eye, the uppermost curving behind and nearly meeting on the occiput, the next or central one extends from above the ear opening to the shoulder, and the third or lowest to below the ear opening. Back with 5 imperfect transverse bands. Tail with from 12 to 15 bands.

Length.—Head and body 1·75, tail from the anus 2·5.

Hab.—Rantah forests in Sind, (Jerruck division) lives under the bark of Babool (Acacia) trees. Collected by Mr. F. Gleadow, Deputy Conservator of Forests, after whom I have much pleasure in naming it.

Hemidactylus karachiensis, *Sp. Nov.*

Plate

Rostral grooved, slightly broader than high. Upper labials 9-10. Lower labials 8-10. Nostrils between the rostral, first labial and three small shields behind. One pair of chin shields in contact with the mental and first labial, and in some specimens just touching the front edge of the second labial. An enlarged shield behind the chin shield in contact with the second labial, and a row of smaller ones along the edges of the others. A row of enlarged scales about the size of those covering the muzzle along the superior edge of the upper labials. Eyelids covered with granular scales. Pupil vertical. The muzzle, or between the nostril and eye, covered with closely-packed granular scales, larger than those on the head. Ear opening moderate. Occipital portion of the head, back, limbs and tail covered with granular scales and studded with tubercles, those on the head small and round, on the back about one-third the size of the ear opening, sub-trihedral and in 16 rows across the middle of the back. Tail verticillate. The tubercles on it are 3-4 on each side of the verticels, and also slightly trihedral; on the first four rings about as large as those on the back. Tubercles on the hind limbs large and rounded. Sub-caudals 38-40 in specimens with unreproduced tails. Of 30 specimens the tails of all except two are wholly or partially reproduced. Præ-anal pores six, arranged triangularly, and interrupted by a single scale. Scales on the chin granular; on the abdomen nearly rounded, with one or two dark spots terminally, and arranged in 38-40 longitudinal series across its middle. In most specimens there is a longitudinal fold of skin along the middle of the back between the fore and hind limbs; the base of the tail is dorsally grooved; the fore limbs laid forward reaches the hind edge of the eye, and the hind limb to about one-third the distance from the axil of the fore limb. Plates beneath the toes 12-14.

Colour in life pinkish grey, a dark line from the nostril through the eye, extending above the ear opening, and to the shoulder in some well-marked specimens; in others slightly beyond the ear opening only, or to above its posterior edge. A small dark patch on the muzzle; the rest of the facial portion greyish white; back and tail with imperfect transverse bands.

Length.—3·5 to 4 inches, of which the tail is from 1·75 to 2 inches.

Hab.—Sind. Numerous at Kurrachee; found during the day, with *Gymnodactylus petrensis*, under stones which have lain on the ground

for some time, and associated with a species of beetle which lives in the same situation in small holes. Both this species and *Gymnodactylus petrensis* frequent houses after dusk.

Gymnodactylus petrensis, *Sp. Nov.*

Plate

Rostral grooved, broader than high, 10-12 upper, and 8-10 lower labials. Nostril between the rostral, first labial and three shields slightly larger than the adjoining ones. One pair of chin shield in contact with the mental and the first and second labials. An enlarged shield behind it in contact with and between the second and third labials; a row of smaller ones along the edges of the others. Upper eyelid well developed, covered with granular scales. Pupil vertical; muzzle, or the space between the rostral and posterior edge of the orbits, covered with coarse, rather convex scales, about half the size of the small ear opening. Occipital portion of the head with granular scales, interspersed with large convex tubercles. Back covered with small granular scales, and sharply keeled trihedral tubercles equal to the ear opening in size, and arranged in 12 longitudinal series in the middle, besides a longitudinal series of much smaller keeled trihedral tubercles along the vertebral area between the fore and hind limbs. The number of tubercles between the hind limbs is six. The tail is verticillate, and each ring bears on each side three sharply-pointed keeled trihedral tubercles, larger than those on the back on 10-12 verticels. The tubercles diminish in size after the 10th or 12th verticel to within half an inch of the tip, where the verticels are lost and replaced by keeled imbricate scales. No distinct sub-caudals, but there are a few large bifid scales irregularly arranged. A pair of tubercles on each side of the sacral region. The fore and hind limbs are covered on the outer side with imbricate, keeled scales, and studded with trihedral tubercles; their inner side with flat scales, regularly arranged in longitudinal rows, and the palmar surface bears a few large round tubercles. The fore leg laid forward reaches a little beyond the end of the snout, and the hind leg to beyond the shoulder and nearly to the ear opening. Scales on the chin small and granular; on the abdomen three times the size of those on the chin, and arranged across the middle in 34-35 longitudinal series, irrespective of the 5-6 rows of granular scales between the lowest trihedral tubercle and the distinctly larger scales of the beginning of those on the sides of the abdomen. Præ-anal pores 4 in a straight line. In two out of seventeen specimens there is an ill-defined fifth one.

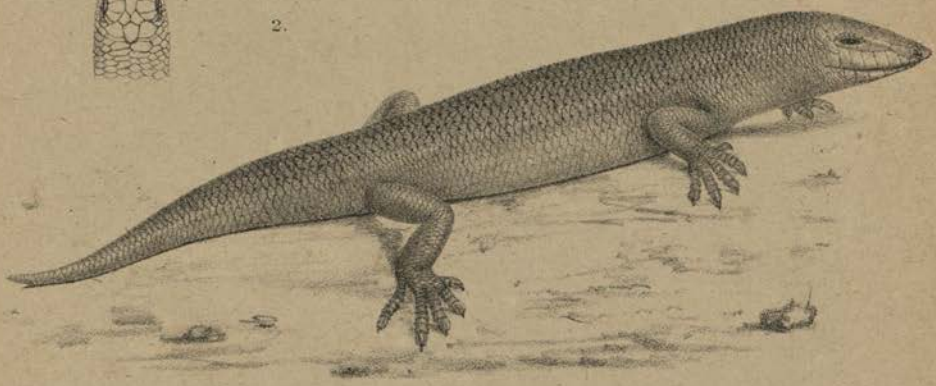
Colour in life brown, with a pinkish tinge, which is lost in spirit. Five imperfect dusky transverse bands on the back and 11-12 on the tail. Looked at with the naked eye each band on the back appears to be divided into three dusky spots in an angular series, the spot in the centre being behind the two on the sides.

Length.—3 to 3·5 inches, of which the tail is from 1·75 to 2 inches.

Hab.—Sind.

Stenodactylus, *Cuvier, D. et B.*

"Toes all clawed, cylindrical, pointed at the end, toothed, the side with



R.Mintern del. et lith.

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1. GYMNODACTYLUS PETRENSIS. 2. SCINCUS ARENARIA.

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denticular cross plates. No femoral nor præ-anal pores. Scales granular, equal. Lower eyelid very short; pupil linear. Tail round, swollen at the base, very slender at the end."—(*Gray, Cat. Liz. B. M.* p. 177.)

Stenodactylus orientalis, *W. Blanford, Journ. As. Soc. Bengal*, vol. xlv. pt. ii. 1876, p. 21; *Murray, Hdbk., Zool., &c., Sind.*, p. 259.

General form stout, somewhat depressed; head flat, short and blunt; tail slightly swollen at the base, thence diminishing regularly, much stouter than in *S. guttatus*, about the same length as the body without the head. Limbs stout; the fore limb laid forward does not quite reach the end of the snout; the hind limb extends to the axil. The largest specimen obtained measures 3·3 inches, of which the head is 0·5 and the tail from anus 1·4. The nostril is situated at the upper outer angle of the rostral, between that shield and three slightly enlarged scales, one of which separates the nasal orifice from the first upper labial. Rostral rectangular, rather higher than the adjoining labials, and about twice as broad; it has a deep vertical groove in the middle, which disappears on its lower portion. Upper labials about 12, lower labials 10-13, both series becoming much smaller behind and passing into the head scales. Mental as broad as the rostral, rounded below. No enlarged chin shields, but the granular scales near the lower labials are a little larger than those of the throat. Upper eyelid well developed, covered with granular scales; lower eyelid wanting. Pupil vertical. Ear opening a vertical slit, not quite equal to the diameter of the eye in length. Upper surface of the head, body and limbs finely granular; over the back there are scattered small convex dark-coloured tubercles; none on the limbs. Lower parts covered with small granular scales, rather flatter than those of the back, but scarcely larger on the abdomen and smaller on the throat. Toes short and thick, all of them finely fringed with short-pointed denticulations, the lower surface with cross plates, each divided into several ribs or tubercles. All the toes furnished with nearly straight claws. Tail finely granular throughout, the granules being disposed in rings.

Colour pale sandy, the tail (and in one specimen the body) with dark transverse bands; a darker line from the eye down each side. The enlarged tubercles on the back are dark brown. In one specimen the sides of the snout and labials are mottled with dusky markings. (*Blanford, J. A. S. B.* vol. xlv. pt. ii. 1876, p. 21.)

Hab.—Sind (South of Rohri, and Hills west of the Shikarpoor district) obtained by Mr. Blanford.

Stenodactylus Dunstervillei, *Sp. Nov.*

Upper labials 15. Lower labials 13-14, with an increasing series of scales, larger than those on the chin and throat, running along their lower edge, there being one between the 1st and 2nd labials, and 7 rows immediately below the middle of the eye. Scales on the chin and throat smaller than those on the belly. Rostral grooved, as high as wide. Nostril between the rostral, first labial and two post-nasals; a scaly fringe

of skin extending from the centre of the rostral above the nostrils on each side to the fourth labial and forming a deep groove. Head and back covered with small sub-equal scales above and below; mental about the size of the rostral and rounded behind; a distinct fold under the throat. Ear opening a transverse slit. Upper eyelids distinct and well-developed, covered with granular scales. Toes long, clawed, 5-5, fringed at the sides and with transverse rows of plates below. No femoral or præ-anal pores. Tail not complete, being reproduced. The scales of the back and sides run so imperceptibly on to the abdomen that it is not possible to count them with accuracy as to their number. I count 115. Pupil vertical. Colour pinkish. A dark brown band from behind the eye extending along each side and meeting at the base of the tail, another across the eyes; a spot in the centre of the head of the same colour; there is also a narrow band across the back of the neck, a nearly perfect triangular or V mark following, and two oblique bars; also a narrow line issuing from the last from the middle, on to the base of the tail. Limbs reticulated with greyish brown, forming roundish white spots.

Locality.—Halla (Sind) found on blown sand, at the roots of *Calotropis* bushes.

Bunopus, *W. Blanford.*

Toes slender, not fringed at the sides, covered below by cross plates which are furnished with projecting tubercles. (*Eastern Persia*, pl. xxii. fig. 4a.) General form as in *Gymnodactylus*. Differs from *Stenodactylus* in the absence of fringes to the toes.

Bunopus tuberculatus, *Blanf. Eastern Persia*, p. 348; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

General form moderately depressed; the head higher and broader in proportion to its length in adult specimens than in young ones. Back granular, with numerous enlarged tubercles in about 14 longitudinal rows (not very regular) larger, and as a rule trihedral on the centre of the back and base of the tail, where they are often nearly as large as the ear opening, smaller and convex on the back of the neck and on the sides. The larger trihedral tubercles are nearly as broad as long. Pupil vertical. Nostril between the rostral, first labial and three small shields behind, the latter scarcely larger than the granular scales covering the muzzle. Rostral about as broad as high, grooved above. Mental rather broad. Upper labials 10-12; lower labials 8-10. No enlarged chin shields behind the mental; but a row of scales along the edges of the labials larger than those on the throat. Ear opening small. Chin and throat covered with small granular scales. Abdomen covered with flat, hexagonal sub-imbricate scales in about 25-30 rows across the middle. A row of præ-anal pores between the thighs in a straight line, usually seven in number, sometimes 6 or 8. Tail when perfect longer than head and body, verticillate, each ring being terminated by a row of large closely-set carinate scales, wanting below and in the centre above. No enlarged

sub-caudals. Limbs moderate, granular above, with scattered enlarged tubercles, the granular scales larger and flatter below, on the thighs especially. Toes and fingers rounded, rather short, and covered with small imbricate scales above. Colour sandy with dark spots, taking more or less the form of cross-bands on the back and tail. Dark marks from the nostrils on each side through the eye, sometimes meeting each other on the occiput. A dark interrupted line on each side from behind the eye, along the side of the back.

Hab.—Mr. Blanford says—"It abounds in parts of Beloochistan, being found in houses and under stones on the hill sides." Specimens were also collected in Sind by Mr. Blanford.

Pristurus rupestris, *W. Blanford, Eastern Pers.* pl. xxiii. fig. 1, 1a, p. 350; *Ann. and Mag. Nat. Hist.* June 1874, xiii. p. 454; *Murray, Hdbk., Zool., &c., Sind*, p. 258.

Plate

Scales of the back, sides and upper part of head and limbs equal, not imbricate, round, convex. *Back not crested.* Tail *compressed laterally, indistinctly verticillate, with a low crest* of flat spines, their points directed a little backward along the top; *none below.* Scales of the sides of the tail equal, granular; those below rather larger and flatter. Scales of abdomen round, flat, a little larger than those on the back, and passing so gradually into the convex scales of the sides, that it is difficult to estimate the number. No femoral or præ-anal pores. Pupil round. Upper eyelid slightly developed; no lower eyelid. Nostril directed laterally upwards between the rostral and about three scales, two of which on each side of the nostril are enlarged, the outer of these separating the nostril from the first labial; the other enlarged scale does not meet the corresponding one on the opposite side of the rostral. Rostral large, cleft above. Mental larger and broader than the rostral. Upper labials 6. Lower labials 3. No enlarged chin shields behind the labials.

Limbs rather elongate, the fore limb laid forward reaches the end of the nose, and laid back extends to the thigh; the hind limb laid forward comes nearly or quite to the ear. Toes 5-5, slender, rounded, with minute claws. Scales above the limbs similar to those on the back, those on the inner anterior side of thigh and below the tarsus larger and flat, those above the toes imbricate. Beneath the toes there are cross plates as in *Gymnodactylus*, scarcely so broad as the toes, the plates beneath the joints of the toes being longer but not broader than the others.

Colour olive grey, a pale band down the centre of the back, the back and sides with rufous spots, forming broken longitudinal lines, those on the back larger than those on the sides, and with a white hinder margin. These spots disappear in spirit. A narrow dark line from nostril to the eye, continued a short distance behind the latter. Chin covered with dark spots.

Length.—2 to 2·5 inches, of which the tail is 1·25 to 1·5.

Hab.—Kurrachee, Jask, Muscat, Arabia, and north west of Bushire.

Eublepharis, *Gray.*

Eyelids well developed. Toes not dilated, all clawed. Pupil sub-elliptical; tympanum thin, deeply sunk.

Eublepharis hardwickii, *Gray, Zool. Journ.* iii. p. 223; *Gunther, Rep. Brit. Ind.* p. 119, pl. xi. *fig.* B; *Theob. Cat. Rep. Brit. Ind.* p. 94; *Murray, Hdbk., Zool., &c., Sind,* p. 258. Gymnodactylus lunatus, *Blyth, J. A. S. B.* 1874, p. 633.

Plate

Rostral with a slit mesially in its upper half and broader than high. Nostrils directed laterally and upwards, and placed between the rostral and first labial. One pair of chin shields and 4-6 enlarged shields behind it in transverse line. 9-10 upper and lower labials. Back granular, covered with large ovate convex tubercles. Tail cylindrical, verticillate, each verticel with 3-4 conical tubercles on each side. Scales of the abdomen sub-imbricate, six-sided, in 30 longitudinal series; 17 pores in an angular series in the præ-anal region.

Colour—top of head (in the young) black from rostral to behind the occiput, with a central white V mark and a transverse line below it. A white horse-shoe-shaped band on the nape, extending to the gape. Upper and lower labials and chin white; back banded dark brown and white, there being one white band across the fore limbs, one in the middle of the back, the third in front of the hind limb. There are five bands on the tail, the tip being black. In the adult the colouring is different; the crown is marked with dark blotches on a white ground, the dark bands across the body and tail are also broken up, but the banded appearance is present.

Hab.—Sind, Punjab, N. W. Provinces, Bengal and Southern India. In Sind it is found with the next species in the more desert tracts, under large stones, stone heaps and old timber; rather numerous from July to September. Both species are considered venomous by the natives, among whom they are known as the "*Khun*," the Biskobra of Europeans, &c. It is a question whether this and *E. macularius* are distinct species, both are found associated, and I am inclined to the belief that *macularius* is the very adult form of *E. hardwickii.*

Eublepharis macularius, *Blyth, J. A. S. B.* 1854, p. 738; *Murray, Hdbk., Zool., &c., Sind,* p. 258; *Theob. Rep. Brit. Ind.* p. 94. G. fasciolatus, *Gunth. A. and Mag. Nat. Hist.* vol. xiv. p. 429.

Sides and back covered with oval tubercles, widely separated by closely-packed granular scales. Nostril in a single shield above the first labial. Eleven upper and lower labials. A pair of large chin shields behind the mental with four smaller ones in transverse series behind it. Fingers more slender and longer than in *Hardwickii.* Tail verticillate, with eight large tubercles transversely arranged along the hinder margin of each verticel.

Colour translucent, pink or fleshy grey in young specimens, with a broad band across the nape, two more across the back, another in the sacral region, and three more, besides its black tip across the tail. A few black tubercles on the body, otherwise spotless. In adults these bands change to ocelli. Grows to 1 foot in length.

Hab.—Sind, Punjab, North-West Provinces. In Sind associated with *E. hardwickii.*

Family, AGAMIDÆ.

AGAMES.

Head covered with numerous small flattish or convex shields. Tongue thick, attached to the gullet along its whole base, not, or but slightly, notched in front. Scales of the back, sides and belly imbricate, generally rhombic. Tail long, tapering, not fragile. Eyelids well developed. Pupil round. Nostril in a separate plate. Teeth implanted on the edge of the bones of the jaw, with generally a pair of canines in front of either jaw. Limbs well developed.

Calotes, *Cuvier.*

Tympanum naked. Back and sides covered with scales, equal in size and regularly arranged, the tips of those on the sides being directed backwards and upwards. Dorsal crest present, formed by non-united spines. Gular sac slightly developed. Sub-caudals as broad as long. Femoral pores none.

Calotes versicolor, *Daud. Rep.* iii. p. 395; *D. et B.* iv. p. 405; *Gunth. Rep. Brit. Ind.* p. 140; *Theob. Rep. Brit. Ind.* p. 109; *Murray, Hdbk., Zool., &c., Sind,* p. 258. (*Surrud,* Hind., Deccan).—THE BLOOD SUCKER.

Two small groups of spines perfectly separated above each tympanum. No fold before the shoulder. Dorsal crest moderately elevated on the neck and anterior part of the trunk, extending on to the root of the tail in large individuals, and gradually disappearing on the middle of the trunk in younger ones. Scales behind the lower jaw much smaller than the others. Gular sac not developed. From 39 to 43 series of scales round the middle of the trunk. Colour variable, sometimes uniform brownish or greenish olive, or yellowish. Generally broad brown bands across the back and a pale lateral band. Two black specks on the occiput, and some streaks radiate from the eye. Young and half-grown specimens have a dark black-edged band across the inter-occipital region.

Seasonally the males assume a brilliant garb. Body bright red, extending to the loins; tail and limbs black; head and neck yellowish.

Hab.—Sind, Beloochistan, Afghanistan, and throughout India, Ceylon, Burmah and Tenasserim.

Calotes viridis, *Gray, Ann. Mag. Nat. Hist.* 1846, vol. xviii. p. 429; *Theob. Rep. Brit. India,* p. 110; *Murray, Hdbk., Zool., &c., Sind,* p. 258.

Nape with two isolated spines above the ears. Neck without any pit in front of the shoulder, but with dark spots at the hinder part of the lower jaw. Eyebrows not horned.

Colour green. Scales large; at base of tail larger; of limbs and under side of the body smaller; of crown smallest; nape and shoulders with a compressed crest. Hinder part of back and tail with an obscure keel.

Hab.—Upper Sind, Beloochistan, Punjab, S. India and the Deccan.

Phrynocephalus, *Kaup.*

Head short, depressed, obtusely rounded in front, covered with small shields; those on the snout and occiput largest and convex. Nostrils in front of the snout directed upwards and forwards. Tympanum hidden. Body and tail depressed, covered with very small scales. Throat with a transverse fold. No dorsal crest whatever. No præ-anal and femoral pores. Viviparous. No canthus rostralis. A distinct groove runs round the upper jaw above the labial shields. Eyes rather small. Eyelid well developed.

Phrynocephalus olivieri, *Dum. et Bib. Erp. Gen.* p. 517; *Blanf. Eastn. Persia*, p. 237; *Gunth. Rep. Brit. India*, p. 160. Phrynocephalus tickelli, *Gray, Cat. Liz. Brit. Mus.* p. 260; *Gunth. Rep. Brit. India* p. 160.—Olivier's or the Afghan Phrynocephale.

Tail depressed at the base, slender, not prehensile, with a series of small spinous tubercles along each side of its basal portion. Scales of the upper parts of equal size, except in the sacral region, where some larger ones are intermixed with the others. Upper labials 31, most of which are triangular and slightly pointed. The hind leg extends to the eye if laid forward. Tail with broad, alternate, whitish and blackish rings. Colour variable. Mr. Blanford notes the colours of living specimens as olive grey, drab or dusky. Along the middle of the back a well-defined oval patch from shoulder to loin, one-third of which is pink or pale purplish. A dark band across the back behind the shoulders, another in front of the thighs, often united by longitudinal bands, one along each side.

Length.—From 3·5 to 4·5 inches.

Hab.—Sind, Beloochistan, Afghanistan, Southern Persia and the Punjab. Inhabiting holes in gravelly situations or barren wastes.

Stellio, *Daudin.*

Body depressed. Scales of back and sides unequal in size and shape. Tail round. Scales irregularly verticillate. Throat with a cross fold. No gular sac; no femoral or præ-anal pores, but thickened spongy scales in the præ-anal region. Tympanum naked.

Stellio melanura, *Blyth; Theobald, Rep. Brit. India*, p. 117; *Murray, Hdbk., Zool., &c., Sind*, p. 259. Laudakia melanura, *Blyth, J. A. S. B.* 1854, p. 737.

Eight rows of enlarged keeled scales on the middle of the back, the keel forming longitudinal lines. No enlarged scales on the back of

the neck, except those forming the nuchal crest. Scales of the sides in transverse rows granular, with a minute apical spine and without enlarged scales among them. 17 upper and 15 lower labials.

Colour olive grey, speckled with darker, some scales paler. Throat and below the shoulders beautifully marked with greyish black.

Length.—11—14 inches, of which the tail is 7·7.

Hab.—Sind, Western Himalayas, Simla and Cashmere. A specimen I have from the north of Jacobabad has 10 enlarged scales in the middle of the back, and, except on the vertebral line and on the tail, the keel on the scales is indistinct; *length* head and body 5 inches, tail 12 inches=17 inches; the rostral is three times as wide as high.

Stellio nuptus, *De. Fil. Gior. dell. I. R. 1st Limb.* vi. 1843; *Blanf. East. Persia*, pl. xix. fig. 1. p. 317.

General form rather stout. Head and body depressed. Tail long, 1½ or twice the length of the head and body. Head rather flat, triangular, broader in males than in females. The breadth of the ear orifices in the former being equal to the length. The fore leg laid back extends to the thigh; in some specimens falls somewhat short of it; hind limb nearly reaches the ear when laid forward. Scales on upper surface of the head mostly smooth, especially those of the supra-orbital and occipital regions. On the snout the scales are bluntly keeled. Nostril of moderate size, directed a little backwards, and situated on the *canthus rostralis*, which is sharp just in front of the superciliary ridge, and then appears interrupted by the nostril. Two or three scales between the nasal shield and the rostral, and the same number between the former and the upper labials. Rostral nearly twice as broad as it is high, and twice the breadth of the supra-labials. Mental (lower rostral) same breadth as the rostral, but longer and pointed behind. Labials very little larger than the adjoining scales, about 15 or more on each side. Scales of the side of the head keeled, those near the upper labials longitudinally elongate; margins of the tympanum, sides, and back of neck ornamented with groups of flattened spines, two on each side of the neck, the posterior pair more widely separated than the anterior ones. Round the tympanum are five almost equi-distant groups, the largest bearing the longest spines, being just behind the ear opening, and there are three or four much smaller groups in an horizontal line under the ear, the hindmost of them being at the extremity of the anterior throat-fold. Some of the scales on the throat in old specimens have distinct spines. Scales of the occiput keeled; of the back imbricate, equal in size, all keeled and terminated by small points. Fifteen or sixteen (13-19) enlarged scales across the centre of the back, arranged in slightly oblique lines converging behind, separated at the sides from the small rhomboidal scales of the flanks. Ventral scales also rhomboidal, larger than those of the sides, though smaller than those of the back, and arranged in transverse and oblique series. No enlarged or tubercular scales on the sides. Scales above the limbs and tail sharply keeled, terminating in points. Scales above the shoulder are almost spines in some specimens. Scales

on the lower part of the tail not keeled near the base, and are in more or less distinct rings. A double fold beneath the chin, a distinct one across the back of the neck, single in the middle, more or less double at the sides; from the side of the neck another fold begins, which runs upwards and backwards above the shoulders, and then descends gradually along the sides to the anterior lower portion of the thigh. There are in the males only 3 or 4 rows of thickened scales in front of the arms, and a small oval patch 5-7 scales long and 5 or 6 broad, of similar thickened scales in the centre of the abdomen.

Colour pale yellowish brown, sometimes more or less dusky. Chin cobalt blue, mottled and veined with yellow.

Length.—16-17 inches, of which the tail is 10-11.

Hab.—Upper Sind near old mosques, &c.; also Beloochistan, Afghanistan, Southern and S. E. Persia.

Trapelus, *Cuv.*

Head convex, covered with unequal scales. Paratoids unarmed. Eyelids with a fringe of small scales. Back not crested, covered with imbricate scales. Pores on the front edge of the vent. Ears with small scales in front.

Trapelus megalonyx, *Gunther, Rep. Brit. Ind.* p. 159; *Theobald, Rep. B. Ind.* p. 118.

Head short, triangular, covered with small convex shields. Canthus rostralis absent. Supercilium formed of rather long narrow shields. Nostrils in front on the snout. Rostral the size of the upper labials, which are square and 38-39 in number all round. Upper margin of the tympanum denticulated. Throat with a transverse fold across, and covered with small smooth scales. No crest on the neck. Body covered with small keeled scales, irregularly arranged; ventral scales small, also irregularly arranged, indistinctly keeled, and in about 22 oblique series between the fore legs. No anal pores in the female. Tail covered with imbricate keeled scales. The fore leg laid back reaches beyond the hip joint. Hind leg laid forward extends to the eye. Fingers with long claws, and with three series of spines below. Colour greyish, marbled with brown, with six ocellated spots along the vertebral line.

Length.—8-10 inches, of which the tail is about one-half.

Hab.—Sind and Afghanistan. Stolickza also obtained a specimen in Sind, which is now, or was, in the Indian Museum at Calcutta in 1872.

Trapelus ruderatus, *Olivier, Voy. Emp. Oth. Eg. et Pers.* ii. p. 429; *Gray, Cat. Liz. Brit. Mus.* p. 258; *Anderson, P. Z. S.* 1872, p. 384.—The Variable Trapelus.

Head short, triangular. Canthus rostralis very small. Rostral little larger than the labial; 7-8 long shields behind the nostril along the superciliary edge to the hind edge of the eye-brow, and 4-5 between the two nostrils, which are lateral and directed upwards. Throat with a cross fold; upper lip fringed with 18-20 scales on each side. Scales

of the head and sides of the head tubercular; of the back imbricate, keeled, and gradually increasing in size towards the tail, on which it is twice the size of the largest on the back. Limbs and toes covered with keeled imbricate scales. Ventral scales indistinctly keeled and in 24-26 series between the fore legs. Length 8 to 8½ inches, of which the tail is 5 to 6½. Colour sandy, or greyish, or pale brown, with a longitudinal paler, or pale white stripe on the neck, and a series of 6 oval patches on the vertebral line, laterally edged with black in females and red in males, with two rows of sub-quadrate spots on the sides. Tail with 12-14 dark brown bands, not extending on its under surface, which, like the entire lower parts, is white, or yellowish white. Limbs with dark patches, each with a mesial yellowish vertical streak, which is indistinct in some specimens; there are also 2-3 dusky bands across the forehead. Claws dark brown in most specimens.

Hab.—Sind (Kurrachee) Bushire, and Shiraz in Persia.

Trapelus rubrigularis, *Rupp.; Murray, Hdbk., Zool., &c., Sind*, p. 259.—The Red-throated Trapelus.

Head short, bluff, covered with unequal sized, rather convex and faintly keeled scales. Superciliary edge covered with smooth imbricate plates in 3 series. Nostril in a single shield placed anteriorly and directed upwards. Rostral nearly three times the size of the upper labials, its upper edge separated from the nostril by two small shields. A median series of enlarged scales on the head, the last of the series with a sub-central depression and three or four larger shields behind. Eyelids scaly, the edges fringed. Ear sunk, with two or three scales on its hinder edge. Upper lip surrounded by 30—32 scales. Back covered with indistinctly keeled imbricate scales, with some distinctly keeled larger ones interspersed. Ventral scales smooth in 22-24 series across the fore legs. Legs slender, covered inside and out with imbricate keeled scales, also the palmar surface of the feet. The fore leg laid back reaches a little beyond the axil of the hind leg, and the hind leg laid forward reaches the hind edge of the eye.

Colour greyish with a longitudinal interrupted dark brown band on each side of the back from the nape, and another from the side of the neck on each side to the shoulder. In well-marked specimens two dark lines behind the eye, and five rather oval white spots on the vertebral line. Tail with 10-12 transverse dark bands. Throat with a patch of red, rest of under parts China white.

Length.—3 to 3¼ inches, of which the tail is 1¼ to 1½.

Hab.—Shikarpoor, Temple Deyra (Upper Sind), Nari base, Muscat, Beloochistan and Persia.

Agama agilis, *Oliv. Voy. Ottom.* ii. p. 428, pl. xxix. fig. i.; *D. et B. E. G.* iv. 497; *Anderson, P. Z. S.* 1872, p. 384; *Murray, Hdbk., Zool., &c., Sind*, 259.—The Agile Agame.

Muzzle short, blunt. Nostrils small, situated behind the 3rd scale from the margin of the upper jaw. A fold before each shoulder. Scales on the forehead convex, larger on the back of the head. Dorsal scales

imbricate, distinctly keeled, and ending in a point. Scales of the belly sub-imbricate, smooth. Ears with some small spines above it. A small group of spines on the nape. Back not crested. Tail long, conical. Colour dark sandy above, the scales tinged bluish on the back. Chin, throat, and sometimes the entire under parts, chiefly the sides of the body, cobalt blue. Tail banded.

Hab.—Sind, Punjab, Beloochistan, Afghanistan, Persia and Arabia.

Uromastix, *Merrem.*

Tympanum naked. Scales minute, granular, of equal size. Tail depressed, surrounded by rings of spinous tubercles, not extending on its lower side. Throat with a transverse fold. No dorsal crest. Ventral scales smooth. Femoral and præ-anal pores present.

Uromastix hardwickii, *Gray, Zool. Journ.* iii. p. 219; *Gunth. Rep. Brit. Ind.* p. 155; *Theob. Cat. Rep. Brit. Ind.* p. 119; *Murray, Hdbk., Zool., &c., Sind.* Uromastix reticulatus, *Cuv. Regne. Anim.*

Head short, obtuse; body and tail depressed; eye rather small; eyelids scaly; snout covered with small shields; nostrils lateral; rostral shield the width of nearly 4 labials; upper labials 12 on each side, the hind ones lobate. Tympanum deeply sunk, fringed with small tubercles in front. A series of large scales from behind the mental towards the temporal region, separated from the lower labials by a granular interspace. Skin of the throat lax, and with several folds. Back covered with unequal-sized granular scales. Tail very broad anteriorly, tapering behind, ringed with transverse series of spinous shields, with granular interspaces. Lower part of tail smooth, covered with small scales, but larger than those on the belly; outer side of thigh of hind leg covered with spinous tubercles. A series of 16-18 pores on each thigh, interrupted in the pubic region. Toes of the anterior pair of feet covered above with sub-imbricate scales, below there are large cross-plates with 3-4 denticulations in front, and an indistinct keel mesially, those on the hind feet the same, but with less broad cross-plates.

Colour yellowish grey, clouded or waved with blackish or reddish brown transverse lines; in some specimens two to three dark lines radiate from in front of the eye. Occasionally a black spot inside of each femur; attains to a length of 15 inches.

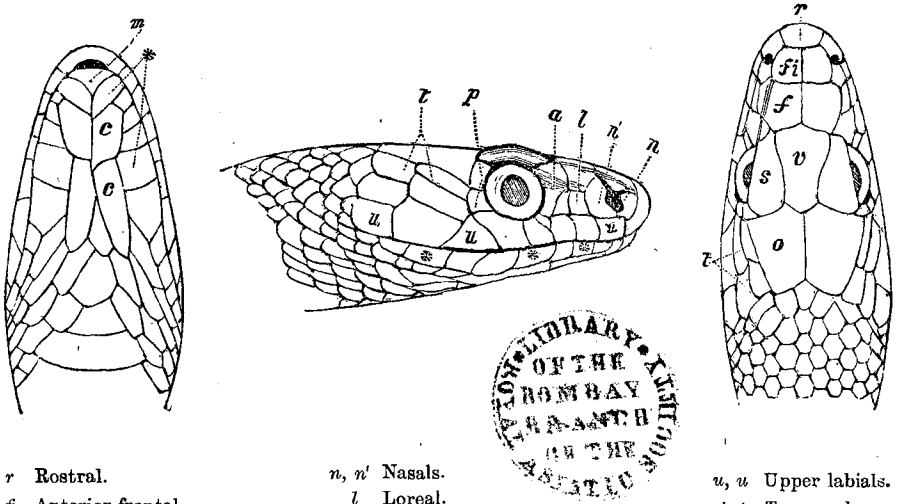
Hab.—Sind, N. W. Provinces, Punjab, Beloochistan, beyond Sibi (not met with at Quetta) and India generally.

ORDER—OPHIDIA.

SNAKES.

Body exceedingly elongate, without limbs or rudiments of limbs; rudimentary pelvic styles scarcely visible externally. Belly covered with broad plates. Head covered with shields. The ribs perform the functions of locomotion, and are articulated with the vertebral column. Sternum none. Tail conical, tapering. Rami of mandible united in front by an

elastic extensible ligament; generally both jaws and palate provided with teeth. Eyelids none. Integuments with numerous scale-like folds, rarely tubercular.



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r Rostral.
fi Anterior frontal.
f Posterior frontal.
v Vertical.
s Superciliary.
o Occipital.

n, n' Nasals.
l Loreal.
a Anterior ocular or orbital; anteocular or præorbital.
p Posterior ocular or orbital; post-ocular or post-orbital.

u, u Upper labials.
t, t Temporals.
m Mental.
** Lower labials.
c, c Chin-shields.

Ophidians are divided into three Sub-Orders:—

1. Harmless colubrine snakes, without grooved or perforated fangs in front.
2. Venomous colubrine snakes, with a grooved fang.
3. Viperine snakes, with a permanently erect perforated fang.

SUB-ORDER I.—Harmless Colubrine Snakes.

Snakes without grooved or perforated fang-like teeth in front. Poison glands none.

Family, TYPHLOPIDÆ.

Blind Snakes.

Body cylindrical. Head short, not distinct from neck. Tail short. Body and tail covered with rounded polished imbricate scales, equal in size and form above and below. Fore part of the head covered with large shields. Upper labials four. Eyelids rudimentary. Cleft of the mouth inferior, short and narrow; a few teeth in the upper jaw only, none in the lower or on the palate. Maxillaries short. Mandibles feeble. Rudiments of hinder limbs hidden beneath the skin.

Typhlops, *Dum.*

Snout covered with large shields; rostral larger, rounded in front; præ-ocular present; nostril laterally in front of the snout.

Typhlops braminus, *Cuv. Cat. Regn. Anim*; *D. et B.* vi. p. 309; *Cantor. Mal. Rep.* p. 52; *Gunth. and Theob. Rep. Brit. India.* Eryx braminus, *Daud. Rep.* vii. p. 379; *Ind. Serp.* i. p. 48, pl. 43.

Rostral not much broader above than below. Nasal entirely separate from the fronto-nasal, but in contact with the præ-ocular, below the fronto-nasal. Nostril lateral. Upper part of the fronto-nasal almost as broad as the rostral; it extends rather more backwards than the rostral, but it does not touch its fellow from the other side. Præ-ocular as large as the ocular. Eye distinct. Labials four, the first in contact with the rostral and nasal; second with nasal and præ-ocular, but not with the fronto-nasal; third slightly ascending between præ-ocular and ocular; fourth below the ocular and extending further backward than the latter shield. Frontal, supra-oculars and parietals equal in size. Body rather thicker behind than in front, the circumference in the middle is about 1-13th of its total length. Tail slightly curved, short, terminating in a minute spine. Scales of body in 20 longitudinal and 316 transverse series.

Colour uniform brown, paler beneath. Upper shields of the head with a faint crenellated whitish marginal line.

Length.—8 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Kutch, Guzerat, Concan and Deccan, generally distributed throughout the Indian Continent and Archipelago. Common also in Ceylon, China and Nepaul.

Typhlops porrectus, *Stol. J. A. S. B.* 1871, p. 426.

Rostral narrowed behind, broader above than in front. The nasal touches the fronto-nasal in front towards the rostral, but is disunited below. The fronto-nasals extend behind the rostral, but without meeting. The nasal is in contact with the first and second labials. The fronto-nasal touches the second labial only. The præ-ocular is in contact with the second and third, and the ocular with the third and fourth labials. The eye is very indistinct, situated below the anterior part of the suture, between the supra-ocular and the ocular. The first upper labial is very small, and in young specimens hardly traceable; the second distinct; the fourth considerably higher and longer than the third. All the head shields finely punctate. Scales of the body in 18 longitudinal and 440 transverse rows in adults.

Colour above pale chocolate or leaden brown, shading into paler below. Grows to 11 inches. Circumference of body $\frac{1}{22}$ of entire length.—(*Theob.*)

Hab.—Sind (Kurrachee) Punjab, N. W. Provinces, Oudh and Bengal.

Family, OLIGODONTIDÆ.

OLIGODONTES.

Body cylindrical or slightly compressed, rather rigid. Head short, blunt, sub-conical, not distinct from neck, ornamented with symmetrical arrow-shaped markings. Body and tail with rounded smooth scales, in 15, 17, 19, or 21 rows. Sub-caudals in two rows. Nostril lateral. Eye of moderate size, with round pupils. Rostral more or less enlarged, flat in front, more or less produced backwards. Maxillary teeth few, the last longest, not grooved.

Oligodon, *Boie.*

Rostral more or less extended backwards. Loreal occasionally absent, two pairs of frontals, one præ-ocular, one or two post-oculars. Scales smooth in fifteen or seventeen rows. Palatine teeth usually absent.

Oligodon subgriseus, *D. et B.* vii. p. 59; *Gunth. Rep. Brit. Ind.* p. 207; *Theob. Cat. Rep. Brit. Ind.* p. 146.

Scales in 15 rows; loreal distinct, exceptionally united with the posterior frontal. One præ-ocular, two post-oculars. Upper labials seven, the 3rd and 4th entering the orbit. Temporals 1 + 2. Ventral shields 180 (187-189)202. Sub-caudals 48-54. Head with symmetrical brown black-edged markings. Back with numerous narrow, rather irregular, reticulated cross streaks, formed by the black edges of some of the scales, and interrupted by three or more less distinct narrow whitish lines, one of which runs along the vertebral line. Belly white, occasionally a minute black dot on the lateral edge of every second or third abdominal shields. Grows to 17 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Anamally Mountains, and southern parts of the Indian Peninsula.

Cyclophis, *Gunther.*

Form slender; head rather distinct from neck; shields of head regular. Loreal present or confluent with nasal. One nasal shield pierced by the nostril. 1-2 præ-oculars, 2 post-oculars. Scales smooth, in fifteen rows. Eye of moderate size; pupil round.

Cyclophis frænatus, *Gunther, Cat. Colub. Snakes, B. M.* p. 120; *Rep. Brit. Ind.* p. 230; *Theob. Cat. Rep.* p. 157; *Murray, Hdbk., Zool., &c., Sind,* p. 261. C. monticola, *Blyth* (*not Gunther*); *Blanfd. Eastern Persia,* p. 408.

Head broad, scarcely distinct from neck. Rostral small, as high as broad. Anterior frontals much broader than long, sub-quadrangular, not quite half as large as post-frontal; vertical broad in front, with the lateral margins converging behind; superciliaries broad behind. Occipitals longish, rounded behind. One præ-ocular, not extending to the upper surface of the head, two post-oculars, one loreal, which is square. Seven upper labials, 3rd and 4th forming the lower part of the orbit. Temporals large, 1 × 2. Two pairs of elongate chin shields, the anterior in contact with four labials. Scales smooth, in fifteen rows. Ventral 165, without keel, slightly bent up the sides. Anal bifid. Sub-caudals 95.

Crown of the head, back and posterior part of body uniform olive. A broad black band begins behind the eye, becomes gradually narrower and disappears in the second fifth of the total length; a second streak or zigzag line from the throat, along the outer edges of the ventrals, a third intermediate between the band and zigzag line, disappearing with the first.

A single specimen from Upper Sind in a very bad state of preservation, and badly injured.

Hab.—Sind, Afghanistan and Fao (Mesopotamia); also the Khasia hills? (*Theob*). Probably occurs in Persia.

Cynophis, *Gray.*

Form somewhat slender and compressed. Head narrow. Tail one-fifth of total length. Eye of moderate size. Pupil round. Nostril lateral, between two plates. One præ-ocular. Scales slightly keeled or with a pair of apical grooves, in 25-27 rows. Anal entire. Teeth numerous in the jaws and palate.

Cynophis helena, *Daud. Rep.* vi. p. 277; *Gunth. Rep. Brit. Ind.* p. 247; *id. Colub. Snakes*, p. 95; *Theob. Rep. Br. Ind.* p. 167. Cynophis bistrigatus, *Gray, Ann. and Mag. Nat. Hist.* 1849, iv. p. 246.

Head narrow, flat, rather distinct from neck. Snout long, obtusely rounded. Rostral rather broader than high. Anterior frontals small, $\frac{1}{3}$ or $\frac{1}{4}$ the size of the posterior frontals. Post-frontals large, rather longer than broad. Vertical nearly twice as long as broad, triangular behind, with the lateral margins convergent. Occipitals elongate, obliquely truncated behind. Loreal longer than high. One præ-ocular, generally in contact with the vertical. Two post-oculars. Nine upper labials, the fifth and sixth and sometimes the hinder margin of the fourth entering the orbit; the fourth sometimes divided. Anterior chin shield in contact with 5 or 6 lower labials. Scales on the back slightly keeled, in 27 rows. Ventrals 220-238. Anal entire. Sub-caudals 85-94. Each maxillary armed with twelve teeth, the middle rather longer than the others.

Colour reddish olive, with numerous more or less distinct, reticulated, black, transverse bands across the anterior part of the back, each of which encloses two white ocelli on either side of the body, one above the other; posteriorly these are replaced by a broad lateral brown band running to the tip of the tail. Neck with a pair of parallel longitudinal black bands above, and with an oblique black band on the side. A black line along the occipital suture; another oblique one from the eye, along the edge of the seventh labial; lower parts white. Grows to 42 inches. Tail about a fifth.

Hab.—Sind (Kurrachee) Rajputana, Kutch, Southern and Central India, and the Deccan (Poona).

Gen. **Ptyas**, *Fitz.*

Body elongate, rather compressed. Tail one-third or more the total length. Head distinct from neck. Eye large. Nostril between two

shields. Præ-oculars 2. Loreals 2-3. Scales smooth, feebly keeled, and in 15-17 rows. Ventrals not keeled. Anal bifid.

Ptyas mucosus, *L.; Gunther, Rep. Brit. Ind.* p. 249; *Theob. Rep. Br. Ind.* p. 168. Coryphodon blumenbachi, *Merr. Tent.* p. 119; *Gunther, Colubrine Snakes, Br. Mus.* p. 111.—THE INDIAN RAT-SNAKE.

Head broad, distinct from neck. Rostral deeply indented beneath, as broad as high. Nostrils between two shields, their upper edges in contact with the præ-frontal and rostral. Præ-frontal not quite half the size of the post-frontal. Post-frontal bent down on the side touching the loreals and hinder nasal shield. Vertical longer than broad, three-sided posteriorly, nearly straight behind the post-frontal, with its lateral margins concave; it is longer than its greatest breadth. Occipitals truncated behind, with two elongated temporals on each side of their outer margin, the anterior in contact with the post-oculars. Upper labials 8, the fourth and fifth entering the orbit. Loreals 3, præ-oculars 2, the upper large, and extending on to the upper surface of the head between the superciliary and post-frontal, but not touching the vertical. One large projecting superciliary. Scales in 17 rows (19 on the neck), the vertebral series keeled, larger than those on the sides, and with two apical grooves. Ventrals large, 196-208. Anal bifid. Sub-caudals 118-130.

Colour olive, the scales with darker margins, those on the hinder part of the body and of tail with broad dark edges giving a reticulated appearance. Grows to 7 feet.

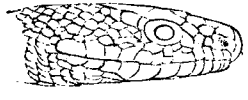
A specimen from Jerruck, 56 inches long, has the scales on the hinder portion of the body and tail, a reddish brown colour, and the hinder margins of the labials, ventrals and sub-caudals similarly coloured, darker on the tail, above.

Hab.—Sind, Indian Peninsula, Ceylon and the Malay Archipelago.

Zamenis, *Wagler.*

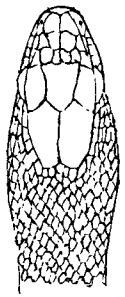
Body and tail elongate, rounded, sometimes very slender. Head distinct from neck; crown flat; muzzle rounded. Eye of moderate size, with round pupil. Nostril lateral, between two plates. The shields of the head have a tendency to split in two or more pieces. Loreal entire or divided: generally 2 anterior and 2 posterior oculars. Eye sometimes surrounded by separate pieces of the upper labials. Scales smooth or slightly keeled (posterior maxillary tooth longest, not grooved). Ventrals rounded or with a very indistinct lateral keel. Anal bifid. Sub-caudals two-rowed.

Zamenis diadema, *Schleg. Phys. Serp.* ii. p. 148; *Russell*, ii. p. 34, pl. 30; *Gunth. Rep. Brit. Ind.* p. 252, pl. xxi. fig. G; *Theob. Cat. Rep. Brit. Ind.* Periops parallelus, *Jan. et Sor.*; *Murray, Zool., &c., Sind*, p. 260.



Zamenis diadema.

Allied to *Z. cliffordi*. Head rather elongate, broader behind. Rostral as high as broad. Præ-frontals rather larger than post-frontals, which are separated from the vertical by a transverse series of four small shields;



Zamenis diadema.

vertical large, five-sided; occipitals obliquely truncated behind. Loreals 3 or 4. One large præ-ocular extending to, or nearly to, the vertical. A ring of small shields surrounds the lower and hinder parts of the orbit. Upper labials small, about 14. Temporals numerous, scale-like. Scales ovate or oblong-ovate, keeled, in 27-29 series. Ventrals 237. Anal entire. Sub-caudals two-rowed; a distinct ridge on each side of the abdomen.

Colour yellowish olive, with a dorsal series of round brown spots, and two series of short brown longitudinal streaks along each side. Each shield on the snout with a brown spot; a brown band crosses the inter-occipital space, and is continued to the angle of the mouth. A horse shoe-like band on the occipitals.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Rajputana and Kutch, also in Beloochistan (Quetta) Afghanistan and Mahim (Bombay).

Zamenis ventrimaculatus, *Gray, Ind. Zool.*, fig. C.; *Lizards*, p. 106. Gonyosoma dorsale, *And. P. Z. S.* 1872, p. 395; *Gunth. Rep. Brit. Ind.* 253; *Theob. Cat. Rep. Brit. Ind.* p. 169; *Murray, Hdbk., Zool., &c., Sind*, p. 260.

Head of moderate length. Habit slender. Rostral as high as broad. Præ-frontals nearly as large as post-frontals. Vertical five-sided, with the lateral margins very concave. Occipitals truncated behind, each with a small semi-circular shield following. Loreal quadrangular. Two præ-oculars, the lower smaller, upper concave and extending to the vertical shield. Two post-oculars. Nine upper labials, the 5th and 6th entering the orbit. Scales oblong, ovate, smooth, without apical groove, in 19 rows. Ventrals 205-220. Anal bifid. Sub-caudals 90-102.

Colour yellowish olive, with numerous very distinct narrow cross bars on the back, each being half as wide as an interspace of the ground colour. A series of small black spots along each side. Belly yellowish, with an irregular row of black dots on each side. A black cross band between the eyes; an oblique black streak below them, another on the temple. A black spot in the loreal region, and a dark line on the median line of the neck.

Hab.—Sind, the Deccan (Poona). Concan (Bombay) Bengal, Beloochistan and Persia, and the whole of South Western Asia to Egypt.

Zamenis gracilis, *Gunth. Ann. and Mag. Nat. Hist.* 1862, p. 125; *Rep. Brit. Ind.* p. 254, pl. xxi. fig. H.; *Theob. Cat. Rep. Brit. Ind.* p. 170; *Murray, Hdbk., Zool., &c., Sind*, p. 260.

Head narrow, distinct from neck. Body and tail slender. Rostral as high as broad. Præ-frontals half as large as post-frontals. Vertical five-sided. Occipitals rounded behind. Loreal square. Two præ-oculars, the upper in contact with the vertical; the lower small. Nine upper labials, the 5th and 6th entering the orbit. Temporals 2+2+3+3, the anterior in contact with the post-oculars. Scales elongate, narrow,

smooth, in twenty-one rows, some with a pair of very indistinct apical grooves. Ventrals 219. Anal bifid. Sub-caudals 120. Abdomen with a slight ridge on each side.

Colour yellowish olive, with a single series of round brown spots, edged with black along the anterior half of the trunk; the spots become indistinct posteriorly, and only the black edges remain, forming cross bars on the back, but merely spots on the tail. A blackish streak across the snout. Crown of the head with two brown black-edged cross bands, the anterior between and below the eyes, the posterior across the occipitals, forming an acute angle on the vertical. The first brown nuchal spot is produced forward within the limb of the occipital cross band. An irregular series of black spots on each side of the belly, which is yellow. Grows to 4 feet or more.

Hab.—Sind, Concan (Bombay) and the Deccan (Poona).

Tropidonotus, *Kuhl.*

Body cylindrical. Head distinct from neck, flat. Cleft of the mouth wide. Eye of moderate size, or rather large, with round pupil. Nostril lateral, between two plates. Shields of head regular. Loreal always present. Two small anterior frontals, acute-angled in front, and forming together an isosceles. Scales keeled. Ventrals rounded, considerably less than 200 in number. Anal bifid. Teeth numerous in the jaws, equal, except the posterior in the upper jaw, which is *longest*.

Distribution world-wide.

Tropidonotus quincunciatus, *Schleg. Ess.* pl. 12, f. 4,5; *D. et B.* vii. p. 592. Trop. umbratus, *Cantor, Mal. Rep.* p. 89; *Gunth. Rep. Br. Ind.* p. 260; *Theob. Cat. Rep. Brit. Ind.* p. 174; *Murray, Hdbk., Zool., &c., Sind,* p 260.

Head and tail of moderate length. Body rather stout. Eye small. Scales keeled in 19 rows. Ventrals 129-146. Sub-caudals 64-80. Anterior frontals pointed in front. One præ-ocular just reaching the upper surface of the crown; three (exceptionally four) post-oculars. Loreal large, square. Nine upper labials, the fourth and fifth entering the orbit, the seventh and eighth largest. Temporals 2+2. Colouration varies exceedingly. Generally two oblique black streaks behind the eye; the upper crosses the temporal plates and the eighth labial; the lower, the inferior post-orbital, running along the suture of the sixth and seventh labials. Upper parts greyish, brownish or greenish olive, with from 3 to 7 rows of black spots down the body in quincuncial order. Sides sometimes with a series of scarlet spots, separated by black cross bars.

Hab.—Sind, and throughout India, Ceylon, Assam, Pegu, Mesopotamia to S. China. Inhabits rivers and pools, feeding on frogs and fishes. Attains 40 inches.

Tropidonotus stolatus, *Linn. Mus. Ad. Fried.* t. 22, fig. 1, and *Syst. Nat.* 1. p. 379; *Boie. Isis*, 1827, 535. Amphiesma stolatum, *D. et B.* vii. p. 727.

Head rather narrow; body and tail of moderate length. Scales in 19 rows. Ventrals 125-161. Sub-caudals 50-79. Anterior frontals pointed in front. Occipitals rounded behind, not much larger than vertical. One præ-ocular extending to the upper surface of the crown; three, rarely four, post-oculars. Loreal square. Eight upper labials, the third, fourth and fifth entering the orbit; the third and fourth are sometimes united into one shield. Temporals large, 1+1. Colour greenish or brownish olive, with numerous reticulated cross bars, intersected by two yellow or white longitudinal dorsal bands. Lower parts white. Head brown above, the shields more or less distinctly edged with black. Præ-ocular and post-ocular white, the former with a black anterior margin. The suture between the 5th, 6th, 7th and 8th upper labials black. Seasonally the head, neck, and sides are yellow, diffused with vermilion.

Hab.—Sind and throughout India. Like the last inhabits pools, &c., and feeds on fishes. Attains to a length of 26 inches.

Tropidonotus plumbicolor, *Cantor, Proc. Zool. Soc.* 1839, p. 54. Xenodon viridis, *D. et B.* vii. p. 763; *Gunth. Rep. Br. Ind.* p. 272; *Theob. Cat. Rep. Brit. Ind.* p. 179.

Form stout. Scales in 25 rows, sometimes in 23 or 27. Ventrals 160-161. Sub-caudals 42. Præ-frontals more than half the size of post-frontals. Two præ and three post-oculars; seven upper labials, the third and the fourth entering the orbit. Temporals 2+3. Vertical five-sided. Occipital not twice as large as vertical. The præ-orbital scarcely reaches the upper surface of the head.

Colour dirty greenish. In the young a broad white or yellow collar, pointed in front and forked behind, with a similar black band in front. An oblique black streak behind the eye. Trunk with ten or eleven narrow cross bars. Sides of the throat black dotted. Belly more or less blackish.

Hab.—Sind, Northern, Southern, Western and Central India; throughout Bengal and Ceylon. Attains to a length of 25 inches. Tail 3 inches.

Family, HOMALOPSIDÆ.

FRESHWATER SNAKES.

Body of moderate length, cylindrical or slightly compressed. Head rather thick and broad, not very distinct from neck. Tail strong, tapering, more or less prehensile and compressed. Scales sub-equal, not much imbricate. Anal bifid. Sub-caudals two-rowed. Eyes small. Nostrils situated anteriorly on the upper surface of the head, valvular. Anterior frontals small. A grooved fang at the hinder extremity of the maxillary bone.

Habits thoroughly aquatic. Several species enter the sea and have a distinctly prehensile tail. All are viviparous. Of the five genera composed in this family one genus only is found in Sind.

Cerberus, *Cuvier*.

Head of moderate length and width. Body cylindrical, its hinder part and the tail rather compressed. Cleft of mouth wide, turned upwards behind. Eye small. Pupil vertical. Snout covered with shields. Occiput with scales. Nostrils between two nasals, the anterior of which is larger, forming a suture with the corresponding nasal of the other side; two small triangular anterior frontals. Eye surrounded by a ring of small orbitals. Posterior upper labials divided transversely into two. Scales keeled in from 21 to 25 rows. Ventrals 132-148. Anal bifid. Sub-caudals two-rowed, 54 to 57. Maxillary teeth in a continuous series, slightly increasing in length posteriorly, the last being grooved. Mandibular teeth longest in front. Viviparous.

Cerberus rhynchops, *Russell, Ind. Serp.* ii. p. 43. pl. 40; *id.* i. pl. 17; *Gunth. Rep. Br. Ind.* p. 279; *Theob. Cat. Rep. Br. Ind.* p. 185. Hydrus rhynchops, *Schn. Hist. Amp.* i. p. 246. Cerberus boæformis, *D. et B.* vii. p. 978.

The two anterior frontals together are as large as one of the posterior. Vertical elongate, generally broken up into smaller shields, sometimes perfect. Loreal as large as, or larger than, the post-ocular extending on to the upper surface of the snout. One præ-ocular sometimes divided; two post-oculars, one infra-ocular; nine or ten upper labials, the fifth below the infra-ocular; some (2 to 4) of the hinder ones split transversely into two. Temporals scale-like. Three pairs of chin shields, of which the anterior are the largest, broadest in front and tapering behind; the second and third pairs wedged in between the front pair and the lower labials. Upper parts blackish ash, with irregular black cross bars; the two or three outer series of scales yellowish. Lower parts whitish, with more or less confluent dark blotches. Labials black-spotted.

Hab.—The Sind and Mekran Coasts and the Coasts of India and Burmah, also the Malayan Peninsula, the Andamans and Nicobars. Attains to a length of 48 inches.

Family, PSAMMOPHIDÆ.

DESERT SNAKES.

Body and tail generally elongate. Head distinct from neck. Loreal region very concave. Scales smooth, in 15-19 rows. Sub-caudals two-rowed. Cleft of mouth wide. Nostril lateral. Eye moderate. Pupil round or vertical. Head shields normal. Posterior frontals rounded or angular behind. Vertical narrow. Superciliaries prominent. Loreal present. One præ and two post-oculars. One of the maxillary teeth longer than the others; the last grooved.

Psammophis, *Boie*.

Head rather long and pointed. Vertical long and narrow. Loreal elongate. Scales lanceolate, smooth, in 15-19 rows. Anal bifid. Pupil round. Front teeth of lower jaw long.

Psammophis condanarus, *Merr. Tent.* p. 108; *Blyth, Journ. As. Soc. Beng.* 1855, xxiii. p. 293; *Gunth. Rep. Br. Ind.* p. 291; *Theob. Rep. Br. Ind.* p. 187; *Murray, Hdbk., Zool., &c., Sind*, p. 261. Psammophis indicus, *Beddome, Mad. Quart. Journ. Med. Sci.* vol. v.

Body and tail slender, rather compressed. Pupil round. Rostral as high as broad. Anterior frontals small, sub-triangular, with the front obliquely truncated, and as long as broad. Posterior frontals rather longer than broad, rounded behind. Vertical narrow, as long as the occipitals. Nostrils in the middle, between two shields. Loreal quadrangular, twice as long as high. One præ-ocular *not reaching to the vertical*. Two post-oculars. Eight upper labials, the fourth and fifth entering the orbit. Temporals 1+3+3. Scales lanceolate, in seventeen rows. Anal bifid.

Back brown, or isabelline brown, with a dark or brownish stripe along each side from head to tail, and a broader stripe, much darker on either side of the belly, which is yellowish. Head uniform dark brown above. A yellow black-edged streak from the rostral along the canthus rostralis, above the orbit to the neck; a second along the upper half of the labial shields.

Hab.—Sind (Jacobabad) the Punjab, N. W. Provinces, Pegu, and Nullay Mullay Hills in the Kurnool district. Grows to 40 inches; tail 8·5 inches.

Psammophis Leithii, *Gunther, P. Z. S.* 1869, p. 505, pl. 39; *Stol. J. A. S. B.* 1871, part ii. p. 439; *Theob. Rep. Br. Ind.* p. 188; *Murray, Hdbk., Zool., &c., Sind*, p. 260.

General characters of *Condanarus*. Præ-frontals small; post-frontals longer than broad. Eight upper labials, the fourth and fifth entering the orbit. *One præ-ocular reaching the vertical.* Scales in 17 rows. *Anal entire.* Colour light reddish olive, with four brown black-edged longitudinal bands, the dorsal ones running to the end of the snout; a narrow brown median one along the vertical shield and occipital suture. Belly and lower half of the last row of scales white.

Hab.—Sind, Beloochistan, Persia, Afghanistan, Punjab and North West Provinces. Attains to 48 inches.

Family, DIPSADIDÆ.

Dipsades.

Body much compressed, elongate. Head short, generally broad behind, sub-triangular. Eye large; pupil vertical. Nostril lateral. Lower jaw with a mental groove. Scales generally smooth. Maxillary bone and teeth well developed. A grooved fang behind.

Dipsas, *Auct.*

Body and tail generally compressed, elongate. Head much depressed, triangular, broad behind, very distinct from neck. Loreal present. One præ and two post-oculars. Nostril between two shields. Head shields

regular. Scales smooth, more or less narrow on the sides. The vertebral series dilated. Anal entire. Sub-caudals two-rowed. Posterior maxillary tooth longest, grooved.

Dipsas trigonata, *Boie, Isis*, 1827, p. 559; *Schleg. Phys. Serp.* ii. p. 267. pl. ii. figs. 6 and 7; *Gunth. Rep. Br. Ind.* p. 312. Dispadomorphus trigonatus, *Fitz. Syst. Rep.* p. 27; *Gunth. Colub. Snakes*, p. 175; *Theob. Cat. Rep.* p. 196; *Murray, Hdbk., Zool., &c., Sind*, p. 210.

Rostral grooved on the under side, obtusely triangular, reaching slightly above the suture of the nasal and præ-frontals. Præ-frontals sub-triangular; post-frontals sub-quadrangular; vertical three-sided behind, pentagonal. Occipitals a little longer than its greatest width, with usually two temporals alongside of their outer margins. Scales smooth, in 21 rows (exceptionally in 19), the vertebral series larger. Ventrals 235-269; sub-caudals 79-87; anal entire. Nostril rather small, rounded. Loreal one, as high as long. One præ-ocular. Two post-oculars. Eight upper labials, the third, fourth and fifth entering the orbit, sometimes the fourth and fifth only. Maxillary with 10 small teeth, and a pair of grooved posterior teeth; two pair of chin shields behind the first and second lower labials, the anterior longest, and 4 labials in contact with it.

Colour yellowish olive with a rather irregular white or yellow zigzag band along the back, edged with black. Crown of the head with two dark bands, edged with black, convergent behind, and a nearly quadrangular dark spot behind, edged with white. Belly white, with an irregular series of brown dots along each side.

Hab.—Sind (Kurrachee, Kotree and Sehwan), Rajputana, Central India, Kutch, Guzerat and Southern India, extending to Bengal and to the foot of the Himalayas. Attains 34-36 inches.

Family, LYCODONTIDÆ.

LYCODONTES.

Body generally of moderate length, rather slender, rounded or slightly compressed. Head depressed; snout flat, obtuse. Eye rather small. Pupil generally vertical. Head shields regular. Nostril between two shields. Posterior frontals enlarged. Maxillary with a fang in front, but without a posterior grooved tooth. Of five genera in this family, one only (*Lycodon*) is represented in Sind.

Lycodon, *Boie.*

Head depressed, distinct from neck; snout flat, obtuse; nostrils between two shields. Loreal present. One præ and two post-oculars. Scales smooth, in 17 rows. Sub-caudals two-rowed. Anal entire or bifid. Pupil elliptical. Maxillary with one of the anterior teeth enlarged; posterior maxillary tooth enlarged, not grooved; palatine teeth not enlarged.

Lycodon aulicus, *Linn. Syst. Nat.* i. p. 381; *Boie. Isis*, 1826, p. 981; *Gunth. Rep. Brit. Ind.* p. 316; *D. et B.* p. 369; *Gunth. Colub. Snakes*, 200; *Murray, Hdbk., Zool., &c., Sind*, p. 261.

Rostral just reaching the upper surface of the head. One loreal, one anterior ocular in contact with the vertical and third labial; two post-oculars. Snout broad, much depressed, long, spatulate. Upper lip swollen, without canthus rostralis. Anterior frontals small, posterior longer than broad. A lateral notch between the anterior and posterior frontals in which the inner anterior angle of the loreal is received. Nostril small, directed upwards, and situated between two nasals. Nine upper labials, the third, fourth, and fifth entering the orbit. Temporals many, and scale-like. Scales 3, smooth, in 17 rows, with a minute apical groove. Abdomen and tail with an angular ridge on each side. Ventrals 183-209. Anal bifid or entire; sub-caudals 57-77. Each maxillary with two fangs in front, in a transverse line.

Colour variable, uniform brown or greyish above, with or without a white collar, and reticulated white cross bands.

Hab.—Sind, and the whole of India and Ceylon. Specimens in the Kurrachee Museum are from Kurrachee, Sehwan, Poona, Bombay and Madras. Attains to a length of 26 inches.

Lycodon striatus, *Russell, Ind. Serp.* i. pl. 16; *Gunth. Rep. Brit. India*, p. 318; *Theob. Rep. Brit. Ind.* p. 199. Coluber striatus, *Shaw, Zool.* iii. p. 527.

Snout much depressed, rather broad, and of moderate length. *Upper lip not swollen*, and without canthus rostralis. Rostral low, not twice as broad as high, slightly bent on the upper surface of the snout. Anterior frontals small, half as large as posterior; posterior as broad as long. Vertical not elongate. Occipitals small, scarcely longer than the vertical. Nostril small, lateral, between two nasals. Loreal one, twice as long as high. Præ-ocular one, in contact with the third labial, but not with the vertical. Two post-oculars. *Eight upper labials*, the third, fourth and fifth entering the orbit. Dentition same as *L. aulicus*. Scales smooth, with a minute apical groove in seventeen rows. *Abdomen and tail without lateral ridge.* Ventrals 167-174; anal bifid; sub-caudals 46-48. Colour brown or black, with or without a whitish collar; body and tail with white cross bands, or a vertebral series of white spots.

Hab.—Sind (Kurrachee) Punjab, N. W. Provinces, Oudh, Deccan (Poona) Madras and Bombay.

Family, PYTHONIDÆ.

Rock Snakes.

Body and tail of moderate length. Size large. Tail prehensile. Head depressed. Snout truncated or rounded in front. Eye moderate; pupil vertical. Scales smooth, in numerous series. Sub-caudals two-rowed. Some of the labials pitted. Teeth in the intermaxillary, maxillary, palatine, pterygoid and mandibular bones of unequal size; none grooved. A spur-like prominence on each side of vent, indicative of a rudimentary limb.

Python, *Daudin.*

Only the anterior half of the head covered with shields; the hinder with scales.

Python molurus, *Linn. Syst. Nat.* i. p. 225; *Gray, Zool. Miscellany*, p. 44; *D. et B.* vi. p. 417; *Gunth. Rep. Brit. Ind.* *The Ajgur* of the Hindoos.

Scales in 65 rows round the middle of body. A pair of anterior and posterior frontals. Several other small shields between the vertical and the posterior frontals. Two anterior upper, and four lower labials, which are pitted. Eleven upper labials, the sixth below the orbit. A brown lanceolate or sub-cordate spot on the crown and nape, its point rests on the frontals, but frequently it is truncated anteriorly, its extremity being on, or behind, the vertical; a light median streak divides its triangular portion. A dark brown streak from the nostril to gape, gradually becoming broader and confluent with another band running along the lower jaw. A vertebral series of large quadrangular spots, sometimes serrated or straight, and an oblong spot on each side of each of the quadrangular spots. Lower parts yellowish, brownish, or blackish on the sides.

Hab.—Sind (Joongshai, Jerruck) Punjab, N. W. Provinces, Oudh, Rajputana, Kutch, Guzerat and the whole of Peninsular India, also Ceylon, the Malayan Peninsula, and Southern China. Commonly kept by snake charmers for exhibition. It is perfectly harmless as to poison, and shows no propensity to bite, but it is said that a bite, though containing no venom, produces a gradual wasting of the fingers and toes.

Family, ERYCIDÆ.

SAND SNAKES.

Body of moderate length, cylindrical, covered with small scales. Tail very short, with a single series of sub-caudals. Eye small. Pupil vertical. Head of moderate length. Snout broad. None of the labials pitted. Cleft of the mouth wide. Teeth in the maxillary, on the palate and in the mandible. None in the intermaxillary; anterior teeth longest. A short conical prominence in a groove on each side of the vent, indicative of a rudimentary hind limb.

Inhabits dry, sandy and stony plains.

Eryx, *Daudin.*

Head not distinct from neck. Snout shielded, obtusely conical, and with a sharp anterior edge. Nostril narrow, lateral. Scales slightly keeled. *Chin with a median groove.*

Eryx johnii, *Russell, Ind. Serp.* ii. pl. 16. p. 18; *Dum. et Bib.* vi. p. 458; *Gunth. Rep. Br. Ind.* p. 334. Clothonia johnii, *Gray, Zool. Misc.* p. 45; *Gunth. Proc. Zool. Soc.* 1860, p. 164. Eryx maculatus, *Hallowell.* (*Loondee*, Sind)—THE DOUBLE-HEADED SNAKE OF EUROPEANS.

Rostral large, wedge-shaped, triangular. Two pairs of small frontals on the upper surface of the snout, one behind the other. Ten to thirteen upper labials, none of which enter the orbit, which is surrounded

entirely by small scales. Scales in the centre of the body in from fifty-four to sixty-five longitudinal rows, all slightly keeled. Ventrals 194-209. Sub-caudals 26-36. Upper parts reddish olive, with or without irregular small black spots and dots. Lower parts grey, marbled with blackish. Young specimens with three or four blackish broad bands on the hinder part of the body.

Hab.—Sind, the Punjab, N. W. Provinces, Oudh, Bengal, Rajputana, Central India, Kutch, Guzerat, Concan, Deccan and Southern India.

Attains to a length of 48 inches.

Cursoria elegans, *Gray*.

A species found in Afghanistan, probably occurs in Sind. The type specimen in the British Museum remains unique.

Gongylophis, *Wagl.*

Head flat, oblong. Snout long, obtusely rounded, without canthus rostralis. Nostril directed upwards. Head covered with scales, only the fore part of the snout and lip shielded. Scales keeled. *Mental groove none.* Chin covered with small scales.

Gongylophis conicus, *Wagl. Syst. Amph.* p. 192; *Gunth. Proc. Zool. Soc.* 1860, p. 163; *Rep. Brit. Ind.* p. 333; *Theob. Cat. Rep. B. Ind.* p. 207. Boa conica, *Schn. Hist. Amph.* ii. p. 268.

Rostral nearly twice as broad as high, with two pairs of small shields, behind the outer of which are the anterior nasals. Twelve upper labials, sub-equal in size, none of which enter the orbit, which is entirely surrounded by scales. The margins of the lower jaw surrounded by a narrow belt of numerous labials. Scales in the centre of the body in from 41-47 series, keeled. Colour brownish grey, with a dorsal series of large quadrangular brown blotches, edged with dark brown and whitish, often confluent and forming a zigzag band, with small irregular spots below. Lower parts white. An oblique streak on the temple behind the eye.

Hab.—Sind and throughout India as the last.

SUB-ORDER II.—OPHIDII VENENOSI.

Venomous snakes with grooved fangs in front of the maxillary.

Family, ELAPIDÆ.

Tail conical, tapering. Head normally shielded. Loreal invariably absent. Nostril lateral. Eye moderate or small. Pupil round. Venom fang grooved in front; the canal in its interior terminates in a slit at the extremity.

Naja, *Laurenti.*

Neck dilatable into a hood. Head rather high and short, not very distinct from neck. Nostrils lateral, between two shields. Eye moderate. Pupil round. One præ, three, sometimes two or four post-oculars. Scales smooth, much imbricate, in numerous series round the hood, and in fifteen rows round the body. Anal entire;

sub-caudals two-rowed. One or two small ordinary teeth at a short distance behind the fangs.

Naja tripudians, *Merr. Tent.* p. 147; *Gray, Ind. Zool.; Gunth. Colub. Snakes*, p. 223; *Rep. British Ind.* p. 338; *Theob. Cat. Rep. Br. Ind.* p. 208. N. atra, *Cant. Ann. and Mag. Nat. Hist.* 1842. N. lutescens, *Laur. Syn.* p. 91.

Six upper labials, the third and the fourth entering the orbit; the sixth small and forms a suture with a large temporal shield. Two temporals in contact with the post-oculars. Scales on the fore neck in 23-25 series.

Colour variable, from brownish olive to blackish brown, with or without spectacles on the neck, which also vary much in development. The Sind varieties are—1. Uniform brownish olive, spectacles conspicuous, black-edged; belly yellowish, more or less marbled. Found also in Poona, Bombay, Madras. 2. Uniform blackish, or brown-black. No spectacles. Found also in Bombay and Poona. 3. Uniform black above and below, with a brownish ocellus on necks (Kurrachee and Jempeer). Attains to 60 inches.

Hab.—All India and Beloochistan; not yet recorded from Persia and Afghanistan, but it is not unlikely it occurs in both.

Bungarus, *Daud.*

Body elongate. Tail comparatively short. Head scarcely distinct from neck. Neck not dilatable. Nostril between two nasals. Loreal none. One præ and two post-oculars. Scales smooth, in oblique rows, forming 13-15 longitudinal series round the body, those of the vertebral row broad and hexagonal. Maxillary with a fang in front. A second, small, simple tooth behind it.

Bungarus cæruleus, *Dœud. Hist. Rep.* v. p. 270; *Gunth. Rep. Br. Ind.* p. 343; *Theob. Rep. Br. Ind.* p. 215. (*Krait*, Hind; *Kalgundait*, Punjab).—THE KRAIT.

One præ-ocular, two post-oculars. Nostrils between two nasals. First temporal shield considerably longer than high. Ventrals 201-221; sub-caudals 38-56. Scales smooth, in fifteen rows. Lower parts uniform white, upper parts bluish or brownish black, more or less lustrous, or with numerous narrow white cross streaks, radiating from a vertebral spot.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Central Provinces, Bengal, Rajputana, Central India, Kutch, Guzerat, Concan, Deccan and Southern India. Attains to 60 inches.

Next to the Cobra, this species is most destructive to human life; its bite is fatal usually in from 20 minutes to an hour; and in cases where immediate medical aid has been obtained, perhaps for a quarter of an hour longer. Very few recoveries are reported. The effect of the poison generally produces a greater degree of stupor than that of the Cobra, and there is apparently less convulsive twitchings; bleeding from the mouth, bloody urine and sputa, and difficult and stertoreous breathing are the fatal symptoms.

SUB-ORDER III.—VIPERINE SNAKES.

Maxillary bone short, furnished with long tubular, erectile, perforated fangs.

Family, VIPERIDÆ.

Head broad or thick, scaly or incompletely shielded. Body stout. Tail short. No pit in the loreal region. Pupil vertical. Scales keeled. Viviparous.

Daboia, *Gray*.

Head covered with scales. Nostril lateral, oblique, extremely large, in and between three shields. A narrow superciliary shield. Sides of the head covered with keeled scales, several series of which are between the orbit and the low upper labials. Scales imbricate, strongly keeled, in 29-31 rows. *Sub-caudals bifid.*

Daboia russelli, *Gray, Viper, Snakes*, p. 24; *Gunth. Rep. Br. Ind.* p. 396; *Theob. Rep. Br. Ind.* p. 217. Vipera elegans, *Daud. Rep.* vi. p. 124. Daboia elegans, *Gray, Zool. Misc.* p. 69.—THE TIC POLONGA OF CEYLON OR RUSSEL'S VIPER.

Greyish brown, with three series of large, black, white-edged rings, those of the middle series ovate, those of the outer circular; there are sometimes very small, black, white-edged ocelli between the rings. A broad arrow mark on the head formed by two pale or yellowish lines from the snout, over the eyes. Head elegantly marbled. A brown spot below the eye. Belly uniform yellowish or marbled with brownish, with generally numerous semi-circular brown spots on the hinder margins of the ventrals.

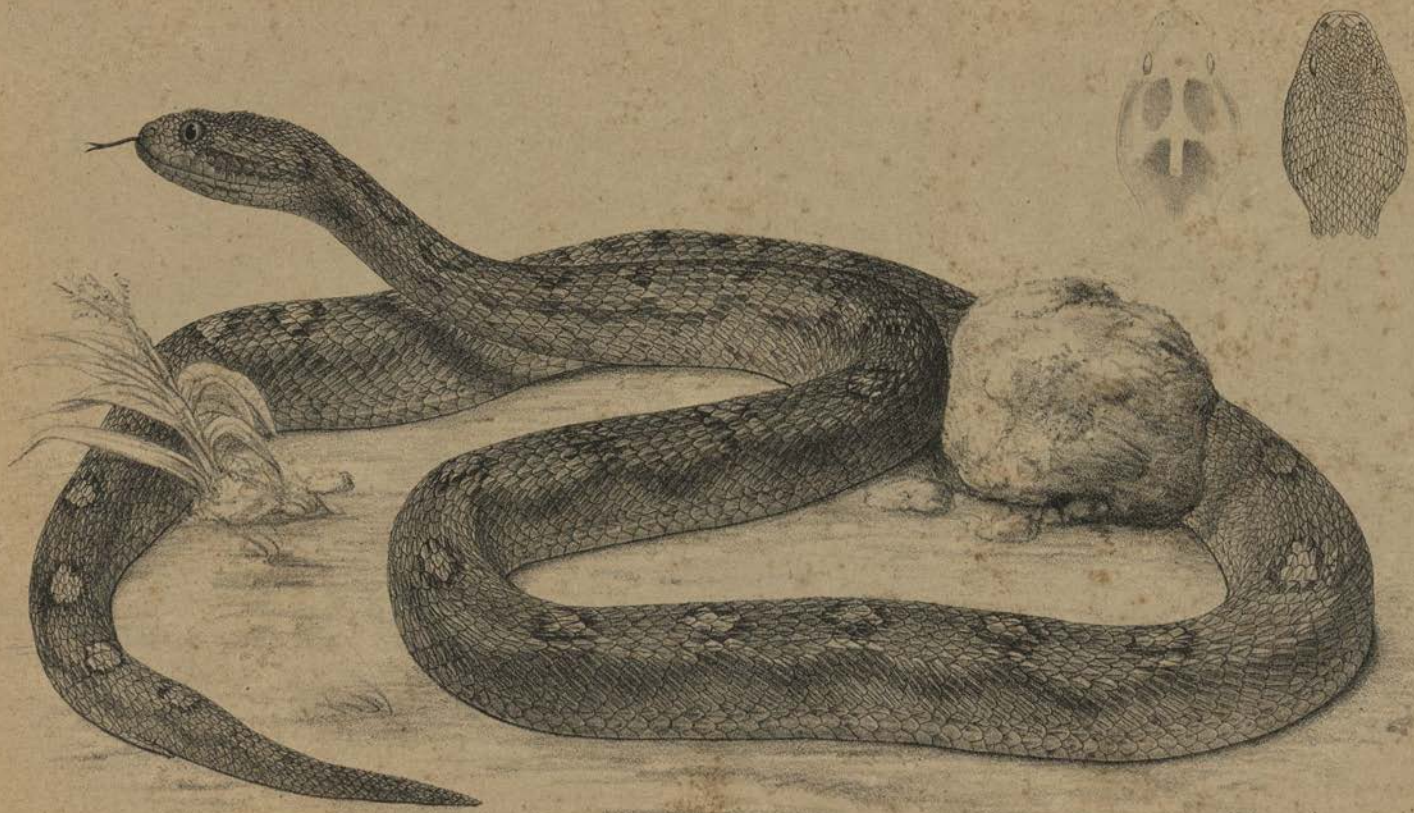
Hab.—Upper Sind (Jacobabad) the Punjab, N. W. Provinces, Oudh, Rajputana, Kutch, Central and Southern India, Concan, Bengal, Ceylon, Arrakan and Pegu. Happily not very common in upper Sind.

Echis, *Merrem.*

Head covered with keeled scales. A pair of very small frontals behind the rostral. Nostril small, round, directed upwards, situated in a large nasal shield, divided below. Two series of keeled scales between the eye and the low upper labials. Scales imbricate, strongly carinate, in from 25 to 29 series round the body, the tips of the lateral series directed obliquely downwards. *Sub-caudals entire*

Echis carinata, *Merr. Tent.* p. 149; *Gunth. Rep. Br. Ind.* p. 397; *Theob. Cat. Rep. Br. Ind.* p. 218; *Murray, Hdbk., Zool., &c., Sind*, p. 260. Horatta pam, *Russell, Ind. Serp.* i. pl. 2. (The *Kuppur*, Sind; *Foorsa*, Deccan and Concan; *Afai*, N. W. Provinces.) Plate

Brown or brownish grey, with a series of sub-quadrangular or ovate whitish spots, edged with blackish. An undulating whitish line on each side of the dorsal spots, each loop enclosing a round dark brown



R. Mintern, del. et lith.

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ECHIS CARINATA

lateral spot. Crown of the head with a whitish or yellowish white lozenge, or arrow-like mark, convergent anteriorly ; a brown spot below the eye, and an oblique streak behind, extending to the gape. Belly whitish, with more or less numerous brown specks.

Length.—12 to 20 inches.

Hab.—Extremely common and in great numbers in Sind, the Punjab, N. W. Provinces, Central and Southern India, the Concan, Deccan, and all along the Western Coast to Ceylon, also Beloochistan and Persia.

This little viper is very venomous. Although the action of its poison is not quite so quick as that of the Cobra, it is equally as potent, and numerous deaths annually occur from its bite. The bite of the young may not be as dangerous, but it occasions great pain and suffering; bloody sputa, and bleeding from every pore, as well as from the eyes and nostrils, are the chief symptoms. Dr Fayrer records several experiments with it, and in every instance (except one, that of his own snake man, who was only slightly punctured accidentally by one fang, and promptly attended to) the bite proved fatal. The latent virulence of the poison is said to be difficult to eliminate from the system. Instances have occurred in which the symptoms have recurred, such as partial paralysis, vertigo and distressing pain in the heart. Prurient sore and eruptions too are known to occur after cures have been effected.

The most popular remedy among the Sindees for the treatment of the bite of this viper and snake bites generally is brandy, or any strong spirituous liquor *ad libitum*, keeping the patient in a state of semi-intoxication; scarification or burning of the wound is also resorted to, poultice of the fresh or dried leaves of *Aristolochia bracteata* applied, and the juice of the leaves administered internally with one part of liquor and a quarter part (nowsagur) carbonate of ammonia, when procurable.

To the efficacy of brandy I can vouch. A small dog of mine was bitten in the leg in one of the Lawn Tennis Courts adjoining my house at about 7 P. M. Immediatly it was bitten it howled with pain, and was quite paralysed within two minutes of the bite. The servants running out to ascertain the cause of the dog having so piteously howled, saw and killed the snake, which was an adolescent Kupper. The dog was immediately brought in. Two distinct punctures were visible under two small serous exudations; ligatures were applied, and the first one ounce dose of brandy was administered through a tin funnel. The dog was quite paralysed, could not stand, the limbs and the whole body was in a convulsive tremor, and a frothy foam came from its mouth, slightly tinged with blood. Six, one ounce doses of brandy were given at intervals of 20 minutes. At the end of five hours the convulsions and frothing subsided, and the dog lay in a sort of stupor. It was placed in a room by itself, having been given up as hopeless, but to my surprise was perfectly well the following day, but extremely dull. Two more doses of brandy were administered, $\frac{1}{2}$ oz. each, and the dog now lives, still in my possession.

Family, HYDROPHIDÆ.

SEA SNAKES.

Body sub-cylindrical anteriorly, more or less compressed posteriorly. Tail strongly compressed, elevated, paddle-shaped. Head shields generally abnormal. Loreal none. Nostrils situated on the upper side of the head (except in Platurus). Eye small. Pupil round. Venom fang small, grooved in front, with a canal terminating in a short slit.

Very widely distributed.

All are venomous, and attain from 2 to 8 feet in length.

Hab.—Trophical parts of the Indian and Pacific Oceans.

Hydrophis, *Daud.*

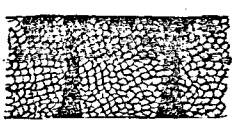
Posterior part of the body strongly compressed. Head short, or of moderate length, shielded above. Only one pair of frontals. Nostril superior, in a single nasal shield, both nasals being contiguous to each other. Scales imbricate or not imbricate, generally with a tubercle or a keel. Ventrals narrow, rudimentary, or absent. Lower jaw without notch in front.

Hydrophis Stewartii, *Anderson ; Fayrer, Thanatophidia*, p. 28.

Neck moderately long and slender. Head rather short, not much broader than the neck. Body much compressed. Rostral considerably broader than high. The nasals are as broad posteriorly as they are long ; third and fourth labials under the orbit, the former not in contact with the nasal. Temporals three ; the anterior the largest. Two post-oculars. Vertical pointed behind. Occipitals long and narrow. Two pairs of chin shields, almost quadrangular, in contact with each other. Thirty-three rows of scales round the neck. Scales hexagonal, not imbricate, with a feeble central tubercle. Ventrals 387, smooth, the first forty about four times as large as the adjoining scales, becoming narrow posteriorly, to within six inches of the tail, where they are hardly discernible. Two pairs of small scale-like anals. Tail broad, markedly dilating from its root. Lips yellowish. Upper surface of head, neck and trunk greenish olive ; under surface of head, sides of the neck and trunk salmon coloured. Fifty-seven very obscure darker olive almost black bars on the dorsal area of the neck and compressed portion, but not extending on to the light coloured sides. Tail greenish olive, mottled and tipped with black. Attains to 40 inches.

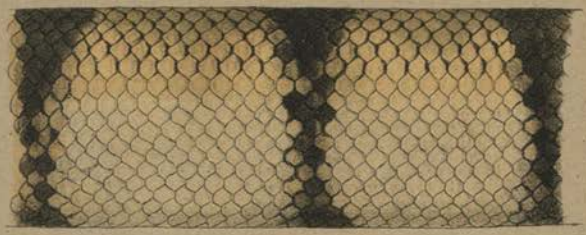
Occurs on the Sind Coast, and at Bombay (Bassein). Dr. Anderson's description is from a specimen obtained at Pooree on the Cuttack Coast.

Hydrophis spiralis, *Shaw, Zool.* iii. p. 564; tab. 125; *Gray, Vip. Snakes*, p. 54; *Gunth. Rep. Br. Ind.* p. 366, pl. xxv. *Fayrer, Thanatophidia*, p. 29. Hydrophis melanurus, *Wagler, &c. Amph.* tab. 3.



Hydrophis spiralis.

Head of moderate size and width. Neck and body somewhat elongate. One post-ocular; the third and fourth labials enter the orbit. Three temporals on the side of each occipital, the anterior largest. Two pairs



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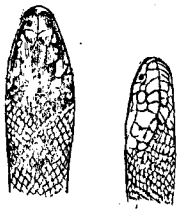
HYDROPHIS BISHOPI.



Hydrophis spiralis.

of chin shields, in contact with one another, 29-33 rows of scales round the neck. Scales imbricate, each with a central tubercle, those on the posterior half of the trunk as high as long and rounded behind. Ventrals 320, twice or thrice as large as the scales of the adjoining series, nearly all undivided. Præ-anals of moderate size. Trunk surrounded by from 42-48 black rings, scarcely broader on the back than on the sides and below, about half as broad as the interspaces of the ground colour. A series of round black spots alternating with the black rings along the vertebral line, commencing either before, on, or behind the middle of its length. Head above black, with a horse shoe-shaped yellow mark, the convexity of which rests on the frontal shields. Lower half of upper lip, chin and throat yellowish; belly black for nearly its anterior half; posterior part of the tail black.

Hab.—Sind and Kutch Coasts, also Madras. Dr. Gunther says the "Indian Ocean," and does not specify localities of the specimens in the British Museum. Attains to 6 feet in length.

Hydrophis Bishopii, *Sp. Nov.*

Plate

Head scarcely distinct from neck. 31-33 scales round the neck; 35-36 round the middle of the body. Scales on the posterior half of the body with a feeble sub-central keel. Rostral triangular, broader than long, forming a suture with the præ-frontal, which is divided furcately to receive it. Præ-frontal longer than broad. Frontals nearly five-sided. Vertical triangular in front, truncated behind. Occipitals twice as long as its greatest breadth. Three temporals along the side of each occipital, the anterior the largest, entering the labial margin, and forming the 6th upper labial. Upper labials seven, 3rd and 4th entering the orbit. One præ and two post-oculars. Two pair of chin shields in contact with each other. Ventrals 372, smooth, twice the breadth of the adjoining scales. Anal shields small, six in number. Last scale of tail four times the size of the adjoining ones. The length of tail nearly four times its breadth. A large patch of greenish olive on the middle of the head, rest of facial portion salmon colour, also the lower labials. Trunk greenish yellow dorsally, and whitish below, encircled with 41 black rings round the body, which are broader above and below,—two rings on the tail. Each scale in the interspaces edged with black at the base.

Hab.—Kurrachee. I am indebted to Captain Bishop, of the I. G. S. "Patrick Stewart," for the specimen described, after whom I have much pleasure in naming it.

Hydrophis cyanocincta, *Daud. Rep.* vii. p. 383; *Gunth. Rep. Brit. Ind.* p. 367; *Fayr. Thanat.* p. 29. Hydrophis striatus, *Schleg. Faun. Jap. Rep.* p. 89. pl. 7. H. sublævis, *Gray, Zool. Misc.* p. 62; *Tenn. Ceylon.* p. 301.—The Chittul.

Head of moderate size and width. Body rather elongate, generally two labials below the orbit. Two post-oculars (exceptionally confluent). Two or more temporals along each side of each occipital. Two

pairs of chin shields in contact with each other. Scales in 29-33 rows round the neck, slightly imbricate, rhombic, and faintly keeled, those on the highest part of the body rather longer than high. Ventrals 320, 360, 406, 426, twice or thrice as large as the scales of the adjoining series; almost all are entire, not longitudinally divided or bi-tubercular. Anals shields four, the outer large. Terminal scale of the tail small, or of moderate size.

Back greenish olive, yellowish on the sides and belly. Trunk with from 50 to 75 black cross bands, which are broadest on the back and broader than the interspaces of the ground colour; on the sides they are narrower, sometimes disappearing on the sides and belly of adult or aged specimens, or visible only as spots on the ventral shields. In young or half-grown specimens the bands surround the body entirely, and are sometimes joined by a black band running along the whole line of the ventral shields. Head greenish olive above, yellowish on the sides; in the young black, variegated with yellow, the yellow colour sometimes forming a frontal and temporal band.

Hab.—Sind, Kutch and Bombay Coasts, also the Coasts of Ceylon, Madras, Bay of Bengal, East Indian Archipelago and the Seas of China and Japan. Attains to a length of 7 feet.

Hydrophis chloris, *Daud. Hist. Rep.* vii. p. 377; *Gunth. Rep. Brit. Ind.* p. 370; *Fayr. Thanat.* p. 29. Hydrophis obscura, *Gray, Vip. Snakes*, p. 49; *Russell, Ind. Serp.* ii. pl. 7.

Head very small, of moderate width. Neck slender, the length of the thin part of the body being more than one-third of the total. Rostral very small, broader than high. One post-ocular; third upper labial not in contact with the nasal. Two pairs of chin shields, in contact with each other. Scales on the neck in 31-33 series, those on the back with faint keel, and with a small tubercle near the apex. Ventrals distinct, not much larger than the adjoining series, 473-500 in number. Præ-anal shields four, the outer are very large. Trunk greenish olive above, yellowish on the side and below, with 59-67, black, rhombic, blackish bands across the back, narrower and fainter on the sides, and extending on the belly; their angles on the vertebral line are somtimes confluent on the anterior part of the body. Head and anterior part of the belly entirely black.

Hab.—Sind, Kutch and Bombay Coasts, also the Coasts of Madras, Bay of Bengal and Penang. Attains to nearly 4 feet in length.

Hydrophis Lindsayi, *Gray, Vip. Snakes*, p. 50; *Gunth. Rep. Br. Ind.* p. 371. Aturia lindsayi, *Gray, Zool. Misc.* p. 61.

Very similar to *H. chloris*, but has a shorter neck. Rostral shield as long as broad. Ventral shields twice as large as the adjoining series, 345-449 in number, a very few longitudinally divided. 48 to 58 blackish brown bands across the back, those on the neck form complete rings, the middle and posterior extending only to the middle of the side, and twice as broad as the interspaces of the ground colour. Head and anterior part of the belly black.

Hab.—The Sind Coast. Specimens in the British Museum are from the Coasts of China, Siam and Malabar, the largest being 39 inches. Kurrachee specimen 41 inches.

Hydrophis tuberculata, *Anderson, M. and S. B.; Murray, Hdbk., Zool., &c., Sind*, p. 262; *Fayrer, Thanatophidia*, p. 28.

Head slightly broader than the neck, and of moderate length. Neck not very slender. Rostral broader than high. Fourth and fifth labials below the eye. One præ-ocular and two post-oculars. 3—4 temporals along the side of each occipital, the anterior the largest and almost entering the labial margin. The nasals are large and quadrangular, and much larger than the frontals, which are rounded behind. The vertical is emarginate and much smaller than the elongated occipitals. All the shields of the head, including the lower labials and scales in the immediate vicinity of the head, are thickly studded over with minute granules. 38 rows of slightly imbricate scales round the neck, each scale with two prominent tubercles, one before the other. Ventrals 321, small, about twice the size of the adjoining scales, irregular, sometimes dividing; those on the fore part of the body largest, and each with several minute tubercles on either side. Four anal shields, the external the largest. Terminal scale of the tail moderately large, tuberculated at its base. Trunk encircled by 59 bands (58-60 in Kurrachee specimens). Eight black bars on the tail. The bands are broadest and blackish on the back, contracting on the sides into narrow indistinct lines, continued on to the ventral surface. Ground colour olive yellow above, bright gamboge yellow below. A dark olive patch on the crown of the head, with a pale yellowish band from orbit to orbit, and passing backwards through the temporals to the neck; an obscure dark line through the upper labials, which are yellowish. (*Anderson.*) Length of Dr. Anderson's described species 49 inches. Kurrachee and Bushire 52 inches.

Hab.—Calcutta, Kurrachee and Bushire (Persian Gulf).

Hydrophis Dayanus, *Stoliczka, Proceedings of the Asiatic Society of Bengal*, 1872, p. 89; *Murray, Hdbk., Zool., &c., Sind*, p. 262.

Head short and stumpy in the young, a little more elongate in advanced age, distinct from neck, which gradually increases in thickness towards the middle of the body. Rostral one-third broader than high; each nasal somewhat larger than a frontal, which equals in size a supra-orbital; vertical hexagonal, obtusely angular in front and much elongated and pointed behind, smaller than either of the two occipitals; one ante, two post-oculars; seven upper labials, the third and fourth enter the orbit; the fourth is sometimes split in two, the penultimate is small, and the last one minute; temporals 2+3+ pl., the lower of the two anterior is only a detached portion of the labial; lower rostral very small, triangular; six lower labials; first three large, posterior three much smaller; two pairs of sub-equal chin shields, either both are in contact, or the posterior one is separated by a small shield; all the head shields above and at the sides are very minutely granulated. There are 33 series of somewhat elongate, sub-imbricate scales

round the neck, but further on the scales become regularly hexagonal, a little higher than long, and are in 40-44 series round the middle of the body. There are 400-415 scales in a line between the angle of the mouth and the vent, and 52-56 in a longitudinal row along the tail, the terminal scale is moderately enlarged, but not forked. Each scale on the body has a minute central keel, and on the side of the tail the keels of the succeeding scales become continuous, forming thin ridges.

Ventral scales each with two short keels; they are 328-334 in number, anteriorly twice as large as the adjoining scales, but posteriorly their size considerably decreases, and many of them become split in two shields. Two pairs of præ-anal scales, the outer twice as large as the inner.

Head olive blackish, tinged with red, brightest on the lower side, an $\mathcal{N}$ shaped vermilion mark on the top of head, composed of more or less isolated spots, the upper convexity rests on the frontals, the lateral branches run along the supraciliary edge, and the ends curve outward towards each angle of the mouth; this vermilion mark becomes rather obsolete with age.

Of two specimens the smaller one is 23 inches, of which the tail is a little above two; the body is moderately compressed, of almost equal height throughout, encircled with 58 black rings, separated above, but united by a black line along the ventrals; the rings are only slightly contracted at the middle of the sides, being separated by narrower yellow bands; the tail has besides eight black rings, the terminal three or four confluent on the lower side, and the tip is entirely black.

Another more adult specimen is 27 inches, of which the tail is nearly 2·5; the body is in the middle twice as high as at the back; there are 46 transverse blackish rings on the body, and six round the tail; each ring is blackest along the back, contracted to nearly half its breadth at the middle of the sides, and from there to the broader base strongly tinged with yellow, which is the general colour of the snake.

Hab.—Kurrachee; in tidal waters.

This species is evidently closely allied to the New Guinean *H. belcheri*, differing from it by the smaller number of scales on neck, the hexagonal ones on the body, keeled ventrals, and by its colouration. Another, as regards colouration, almost identical species is *H. tuberculata*, (*Anderson, Journ. A. S. B.*, xl. p. 18), but it has 38 rows of scales round the neck, two keels in a line on each scale, and several keels on each ventral. The scales on the side of the body are also slightly more elongate, and there exists a noticeable difference in the arrangement of the labials, and the form of the head shields.

Hydrophis robusta, *Gunth. Rep. Br. Ind.* p. 364. H. nigrocincta, *Schleg. Phys. Serp.* ii. p. 505. pl. 18. (not synon.) *Fischer. Abhandl. Natur. Hamb.* iii. p. 46. tab. 1.

Head of moderate size and width. Neck and body not elongate. Two or three upper labials below the orbit. One post-ocular. Anterior temporal shield large. Two pairs of chin shields in contact with each

other. Scales slightly imbricate, each with a sub-central tubercle, those round the neck in 31 rows, those on the highest part of the body rounded or sub-truncated behind, as high as long. Ventrals smooth, 310 in number, twice or thrice as broad as the adjoining series. Terminal scale of the tail rather large. Trunk with 35 narrow, distinct, black rings extending round the belly, sometimes interrupted on the sides and dilated on the back. Head without markings in the adult. Throat and belly whitish.

Hab.—The Sind, Kutch and Bombay Coasts.

Hydrophis curta, *Gunth. Rept. Br. Ind.* p. 379. Hydrus curtus, *Shaw, Zool.* iii. p. 562. Hydrophis propinquus, *Jan. Iconogr. discr. in Rev. et Mag. Zool.* 1859.

Head short, thick, obtuse. Anterior part of body stout, not elongate. Occipitals always divided into two or more pieces, or broken up into small shields. Two pairs of chin shields, separated in the middle by small gular scales. One post-ocular. Scales round the neck in 30-34 rows. 209-252 scales in a lateral series between the angle of the mouth and vent. Ventrals 156-160, nearly twice as broad as the scales of the adjoining series. Præ-anal shields four, small. Back with 50-53 black bands, broadest in the middle, nearly touching each other, and tapering on the sides generally, not extending to the belly. A more or less distinct yellowish streak on the temple. Tail black, with only two yellow transverse spots at its root.

Hab.—Sind Coast, and also that of Beloochistan, Persian Gulf, Bengal and Southern India.

Hydrophis gracilis, *Shaw, Zool.* iii. p. 560; *Gunth. Rep. Br. Ind.* p. 373.

Head very small, and narrow. Neck very slender. Rostral shield cutting in front; one post-ocular; the third upper labial not in contact with the nasal. Two large temporal shields along the side of the occipital. Two pairs of chin shields, in contact with each other. 19 to 21 series of scales round the neck, scales provided with central tubercles. The ventral shields are twice as large as the scales of the adjoining series on the slender anterior part of the body; those of the compressed part are split into two, both halves being first opposite to each other, and alternate posteriorly. They are 228 (247-254) 264 in number. Six small anal shields. Anterior part of the body surrounded by blackish rings, which become very indistinct posteriorly. The hinder half of the body is greenish olive above and whitish below; sometimes traces of darker cross bands extending downwards to the belly are visible. Throat, anterior ventral shields, and crown of head blackish, sides of the head and snout lighter.

A young specimen has 41 rhombic black cross bands, continued on to the belly, but sub-interrupted on the sides; head, ventral shields and posterior part of the tail black.

Hab.—Sind, Beloochistan Coast, Persian Gulf, Bay of Bengal, Kutch, Bombay and Southern India.

Hydrophis Guntherii, *Sp. Nov.*

Plate

Upper jaw projecting much beyond the lower. Ventrals 225. Scales round neck in 19 rows, 33-34 round the body.

Head black, very small and narrow. Neck very slender. Upper jaw projecting much beyond the lower. Rostral as broad as high. Nasals twice as long as broad. Vertical pyriform. Occipitals narrow and truncated, with a small shield behind, between their furcation. Two large temporals alongside the occipitals, the anterior the largest, and nearly entering the labial margin. Upper labials five, the first very small, and with the second, in contact with the nasal; 3rd and 4th enter the orbit. Præ-ocular one. Post-ocular one. First pair of lower labials long and in contact with the first pair of chin shields, which are in contact with each other. Scales smooth on the slender anterior part of the body, bi-tuberculate on the posterior. The ventral shields are twice as large as the adjoining scales on the slender anterior part, split into two on the posterior, and almost uniformly opposite each other. General colour yellowish. The trunk ventrally black on the anterior slender portion, the sides with large roundish yellow spots. There are 46 dark bands on the body, which become nearly obsolete towards the tail, which is tipped broadly with black.

Allied to *H. gracilis*, from which it differs in having a protruding upper jaw, one præ-ocular, the anterior temporal nearly entering the labial margin. Scales of the body not tuberculate, except on the posterior portion, where they are bi-tuberculate.

I have pleasure in associating with this species the name of our veteran herpetologist.

Length.—32 inches. Tail 2¾.

Enhydrina, *Gray.*

Differs from Hydrophis in having a deep longitudinal cleft or notch in front of the lower jaw.

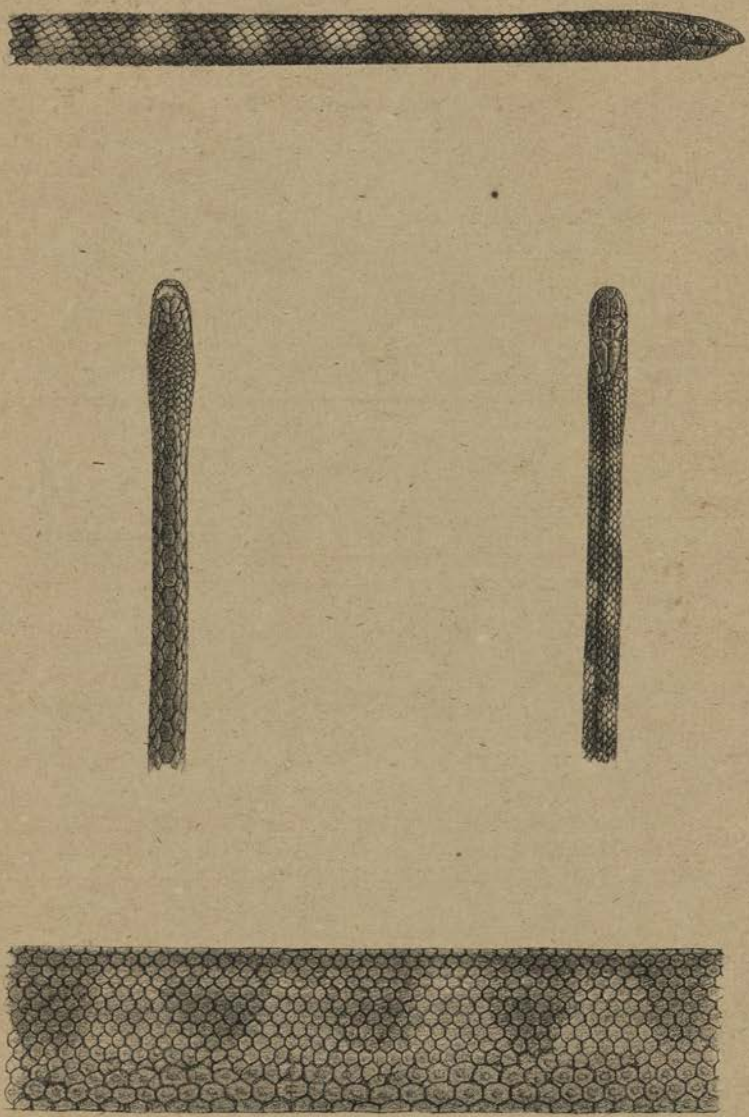
Enhydrina bengalensis, *Gray, Vip. Snakes*, p. 48; *Gunth. Rep. Br. Ind.* p. 381. Hydrus schistosus, *Cant. Mal. Rep.* p. 132. H. valakydyn, *Boie. Isis*, 1827. Valakadyn, *Russel, Ind. Serp.* 1. tab. ii.

Head rather short, of moderate width. Neck and body moderately elongate. Rostral small, lobuliform, its projecting point fitting into a corresponding cavity of the lower jaw. The fourth upper labial below the eye. Mental shield narrow and long, situated in a groove. Throat covered with scales. One post-ocular, sometimes divided into two. Forty-eight series of scales round the neck. Scales scarcely imbricate, hexagonal, each with a short keel. Ventrals 284-314 in number. Terminal scale of the tail rather large. Attains 4 feet in length. The young has black rhombic bands across the back, which disappear with age.

Hab.—Sind, Kutch and Bombay Coast, the Madras Coast, and in the Bay of Bengal, also Beloochistan and the Persian Gulf.

Pelamis, *Daud.*

Head flat, very long. Snout spatulate. Neck stout. Nasal shields



R. Mintern del. et lith.

Mintern Bros. imp.

HYDROPHIS GUNTHERI.

contiguous, longer than broad. One pair of frontals. Scales not imbricate, tubercular or concave. Ventrals none, or very narrow. Lower jaw without notch in front.

Pelamis bicolor, *Daud. Rept.* vii. p. 366; *Gray, Vip. Snakes*, p. 41; *Gunth. Rep. Br. Ind.* p. 382. H. variegata, *Schleg. Faun. Japon.* tab. 8. Pelamis ornata, *Gray, Vip. Snakes*, p. 43.

Two or three post-orbitals. 45-51 rows of scales round the neck. 378-440 scales in a lateral longitudinal series from the angle of the mouth to vent, with or without tubercles. Colour variable. Upper parts of head and back uniform black, under parts and sides brownish olive or yellowish.

Hab.—Sind, Kutch and Bombay Coasts, also on the Beloochistan Coasts, the Persian Gulf, and throughout the tropical and sub-tropical parts of the Indian and Pacific Oceans.

Second Sub-Class, BATRACHIANS.

Only one ventricle of the heart. Atrium incompletely divided into two. Passing a metamorphosis. Breathing by gills in an early stage of their development, the gills being permanent in some species. Two occipital condyles.

ORDER, BATRACHIA SALIENTIA.

TAILLESS BATRACHIANS.

Body broad, short, with four legs, and without tail in the perfectly developed state.

Section opisthoglossa. Tongue adherent in front, and more or less free behind.

Family, RANIDÆ.

Ranina with webbed toes, cylindrical processes of sacral vertebræ, and without paratoids.

Rana, *Auctorum.*

Habit generally moderate; fingers quite free, none of them opposed to the others. Toes more or less webbed, generally with broad web. Head covered with skin. Skin smooth, or with cutaneous or glandular folds. Never a large paratoid gland. Vomerine teeth in two series or groups. Tongue large, free, oblong and deeply notched behind. Metatarsus with one or two blunt tubercles. Males with two lateral vocal sacs, exceptionally wanting.

Rana kuhlii, *Schleg. Mus. Legd. Batav.; D. et B. Erpet.* gen. p. 384; *Gunth. Batrach Salientia*, p. 8; *Rep. Br. Ind.* p. 404, pl. 26. Rana corrugata, *Peters. Monatsber, Berl. Acad.* 1863, p. 412.

Snout short, rounded, without canthus rostralis. Eyes very prominent, directed obliquely upwards and forwards. Lower jaw generally with a pair of very prominent fang-like apophysis in front. Vomerine teeth small, in two oblique series, convergent behind. Skin on the back with short longitudinal or transverse plaits, which become indistinct with age, and with small tubercles. Hind limbs thick and short,

the distance between vent and metatarsal tubercle being equal to, or somewhat more than, the length of the body. Tips of toes slightly swollen; fingers tapering; toes completely webbed, a narrow fringe along the inner metatarsal edge, including a single elongate tubercle. Brown above, marbled with darker. A yellowish cross band between the eyes. Lower parts whitish. Throat and inner side of the hind limbs marbled with brown. Attains from 2 to 4 inches in length.

Hab.—Sind, Beloochistan, Kutch, Bombay, Bengal, Ceylon and Java.

Rana cyanophlyctis, *Schn. Hist. Amph.* i. p. 137; *Peters, Sitz. Berl. Acad.* 1863; *Gunther, Rep. Br. Ind.* p. 406; *Blanford, East. Pers.* ii. p. 433. Rana bengalensis, *Gray, Ind. Zool.*; *Kelaart, Prod. Faun. Zeyl.* i. p. 192. Rana leschenaulti, *Cantor. Mal. Rep.* p. 138; *Gunth. B. et Sal.* p. 11. (*Daydur*, Sind.)

Snout moderate, without canthus rostralis; tympanum distinct, as large as the eye; lower jaw with two distinct apophysis in front; vomerine teeth present, small, in two oblique series converging behind. Tongue deeply notched. Vocal sacs large, externally separated, situated in a long slit at the lower margin of the mandibles, but communicating with each other interiorly. No fold of skin across the occiput. Back tubercular, warty or nearly smooth. Hind limbs moderate, the distance between vent and knee being one half the length of the body; fingers pointed; tips of the toes very slightly swollen; webs entire, reaching to the tips of the toes; a cutaneous fringe along the outer margins of the first and fifth toes, and an indistinct fold along the metatarsus. Fourth toe slightly longer than the third and fifth; metatarsus with a single pointed tubercle.

Colour in life—Adults.—Upper parts greenish yellow, dirty yellowish in some, with irregular spots of dark brown. Usually a large subtriangular dark spot between the eyes on the occiput; fore and hind limbs externally barred and marbled with dark brown; a yellow band along the under side of the thighs from one ham to the other. Under side white, thickly spotted with dark brown. Webs of hind feet yellowish, faintly marbled with brown. In adolescent specimens from 1 to 1½ inches long, the markings are similar; the vomerine teeth are wanting, and in every respect agree with the description of Gunther's *Dicroglosus Adolphi* (*Rep. Br. Ind.* p. 402.) Young, and undeveloped specimens with a small tail have their under surface unspotted white. There is no trace of vomerine teeth, and the metatarsal tubercle, (the limb laid forward) reaches a little beyond the eye, while in adults and adolescent specimens this tubercle reaches the end of the snout or beyond.

Hab.—Sind, Beloochistan, Punjab, N. W. Provinces, Oudh, Lower Bengal, Kutch, Rajputana, and the Western Presidency generally, also Ceylon, Southern India and Nepaul.

Rana tigrina, *Daud. Rain.* p. 64, pl. 20; *D. et B. Erpét.* gen. viii. p. 375; *Kelaart, Prod. Faun. Zeyl.* i. p. 192; *Gunth. Batr. Sal.* p. 9; *Peters. Sitz. Berl. Acad.* 1863, p. 77. Rana cancrivora, (*Boie*) *Gravenh. Delic.* p. 41; *Murray, Hdbk., Zool., &c., Sind*, p. 262.—The Bull Frog.

Snout moderate, without canthus rostralis. Tympanum moderate, as

large as the eye. Two distinct but scarcely prominent apophysis in front of the lower jaw; vomerine teeth distinct, in two oblique series, converging behind. Skin of the back with numerous short longitudinal folds. Tips of fingers and toes slightly swollen; fourth toe one-third longer than the fifth; all broadly webbed, the web not extending quite to the tip of the fourth toe. Fifth toe with a cutaneous fringe along the outer margin. Metatarsus with a slight fold of skin along its inner edge and with a sub-crescentic tubercle.

Colour in Life.—Upper parts greenish brown with ovate, sub-quadrangular and rounded black spots. Usually a yellowish white vertebral line from the tip of snout to the vent. Limbs barred with dark brown. Under surface white.

Length.—Head and body 4 to 6·5 inches. Hind limb from vent, 7 to 8 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, Western Presidency generally, Southern India and Ceylon.

Pyxicephalus, *Tschudi.*

Head large and thick; muzzle rather short; vomerine teeth in two oblique series. Tongue large, free and deeply notched behind. Metatarsus with a flat, sharp-edged spur. Toes incompletely webbed.

Pyxicephalus breviceps, *Schneid. Hist. Amph.* i. p. 142. Pyxicephalus fodiens, *Jerd. J. A. S. B.* 1854, p. 534. Sphærotheca strigata, *Gunth. Batr., Salienta*, p. 20. pl. ii. fig. A.

Body short. Head covered with moveable skin. Occiput swollen. Tongue cordiform, free and deeply notched behind; a cleft on each side of the tongue of males for the vocal sac; vocal sac externally formed by two lateral bladders communicating in the middle; tympanum round, distinct, nearly as large as the eye. Vomerine teeth in two oblique series, convergent behind, but with an interspace between. Limbs short; fingers free, each with one or two tubercles on the palmar surface. Metatarsus with a larger, oval, outer tubercle and with a smaller inner one. Skin smooth, with some small indistinct tubercles. Nostril near the muzzle, and very near the canthus rostralis.

Colour above yellowish brown, generally with a yellow dorsal band from the snout to the anus, and with dark brown, sometimes confluent spots. Crown with two oblique brown streaks, beginning on the upper eyelids, convergent behind and separated by the yellow vertebral streak. A brown streak from the eye along the canthus rostralis; beneath nearly uniform white.

Length.—1·75 to 2·5 inches.

Hab.—Sind, Punjab (Simla), N. W. Provinces, Oudh, Bengal, Southern India (Madras), Ceylon and Southern Africa.

Tomopterna, *Bibr.*

Characters same as those of *Pyxicephalus*. Males with an internal sub-gular sac. Toes half-webbed.

Tomopterna Strachani, *Sp. Nov.*

Muzzle very little longer than broad. Snout obtuse. Tympanum

distinct, circular, as large as the eye. Crown flattish. Lower jaw with weak bony prominences. Skin of the back with short longitudinal folds; a fold on each side of the abdomen, and another across the under surface of the body, immediately behind the fore limbs. A plait behind the tympanum coming down to the shoulder. Fingers quite free, swollen at the tips, and with a tubercle on each articulation on the palmar surface; there are also three well developed *palmar pads*. Laid beside each other, the first, second and fourth fingers are of equal length; the third about one-third longer than the three others. Hind limb longer than the head and body; laid beside the body, the metatarsal tubercle reaches the end of the snout. Metatarsus with a sharp-edged spur on the inner side and a tubercle on the outer. Toes half-webbed, the tips slightly swollen, and each of the joints on the under surface with a tubercle. Third toe slightly longer than the fifth; fourth the longest.

Colour greyish, with a rufescent tinge. A dark brown sub-triangular spot on the occiput, extending from across and behind the eyelids, immediately following which is a filiform white vertebral streak, extending to the vent; back with six irregular shaped dark brown spots. Plait behind the tympanum reddish brown. Fore and hind limbs externally with transverse bars of the same colour. Upper and lower jaws with vertical bars of reddish brown as in *T. delallandi* (*Bat Sal. B. M.* pl. ii. fig. A). Chin, throat and rest of under surface white.

The species of this genus belong to the South African fauna. Gunther gives *T. natalensis* and *adspersa* from the Cape and Natal. I was at first inclined to put this down as *Pyxicephalus breviceps*, but on closer examination I found it to differ very materially in the form of the toes and disposition of the tubercles on their hinder surface, the short longitudinal plaits on the back and the fold across the body behind the fore legs; on the under surface are also two very prominent and distinguishing characters.

Hab.—Sind (Mulleer). I am indebted to Mr. J. Strachan, of the Kurrachee Municipality, for this single specimen, which was received with about three dozens of *Rana cyanophlyctis*. I have pleasure in associating his name with it.

Family, BUFONIDÆ.

Toes webbed, processes of sacral vertebra dilated. Paratoids present.

Bufo, *Auct.*

Snout round or truncated. Crown flatter or with ridges. No cutaneous fold on the sides. *Tongue entire, ovate, and free behind.* Paratoids distinct, swollen. Skin more or less warty. Toes entirely or partially webbed. Males generally with a single vocal sac, not visible externally.

Bufo melanostictus, *Schneid. Hist. Amph.* p. 216; *Cant. Malay Rep.* p. 142; *Gunth. Batr. Salienta*, p. 61; *id. Rep. Br. Ind.* p. 422.—The Common Indian Toad.

Crown deeply concave, with a bony enlargement round the orbit above and bent down between orbit and paratoid. Paratoids moderate, elongate, prominent, as long as, or larger than the head. Tympanum distinct, nearly as large as the eye. Skin of the back and external or upper surface of the limbs covered with conical tubercles, generally a double series runs down along the vertebral line. Tubercles covered with a sooty or blackish horny substance. Legs short, the length of the hind limb being not more than the length of the body; metatarsus with two prominences; tarsus without longitudinal fold. Toes half webbed.

Colour uniform brown, greyish olive or earthy brown above, marbled with dark brown or pale brown. Under surface buffish white. Young the same, the lower surface pale brown.

Length.—2 to 3 inches.

Hab.—Sind, Punjab, N. W. Provinces, Oudh, Bengal, South, Central and N. W. India, Assam, Nepaul and the Andamans.

Bufo Andersonii, *Sp. Nov.*

Snout rounded in front. Crown of the head flat, without any elevated bony ridges, the inter-orbital space as wide as, or a very little wider than the upper eyelid. A narrow groove in front of the eye, and another behind it, between the tympanum and paratoid. Tympanum distinct, and as large as the diameter of the eye, smaller in some, and with a distinct semi-circular ridge edging it in front. Paratoids rather oblong, elliptic, and slightly larger than the head. A paratoid-like gland behind the maxilla, from which it is separated by a vertical groove. Back covered with rather flattish tubercles, which are more prominent, in the sacral region. Limbs the same, but with faint indications of dark brown spots in the centre of a few tubercles. Tarsus with a longitudinal fold of skin. Toes a little more than half webbed, the tips brownish, tuberculous below. Metatarsus with two well-developed pads of equal size, the outer, and in some the inner, more prominent. The first finger laid beside the second is slightly the longer, and as long as the fourth. The hind limb is much longer than the head and body; laid forward the metatarsal tubercles reach to the front edge of the eye. Colour brownish or greyish olive, marbled with dark brown. Lower surface pure white, including the labial edge of the upper jaw.

Hab.—Sind, (Tatta (ponds) and Joongshai.)

This may turn out to be an aberrant form of *B. melanostictos*, with which it is associated in the lakes and ponds at Tatta and Joongshai. It differs however from it in having a longitudinal tarsal fold, also by the absence of prominent conical, spine-bearing tubercles, as well as by its much longer hind limbs.

Table showing the Geographical Distribution of the Sind Fauna.

MAMMALS.

	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	South India.	Page.
1	Pteropus medius, *Tem.*	×	...	...	×	×	×	×	×	×	×	×	×	×	×	2
2	Cynonicteris amplexicaudata, *Peters.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	3
3	Cynopterus marginatus, *Cuv.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	4
4	Phyllorhina tridens, *Peters*...	...	×	...	...	...	...	...	...	...	...	...	...	...	...	6
5	Phyllorhina tridens, Var Murraiana, *And.*	...	×	...	...	...	...	...	...	...	...	...	...	...	...	7
6	Phyllorhina speoris, *Peters*...	...	...	...	×	×	×	×	×	...	×	×	×	×	×	7
7	Phyllorhina fulva, *Peters.* ...	...	...	...	×	×	×	×	×	...	×	×	×	×	×	8
8	Megaderma lyra, *Geoff.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	9
9	Vesperugo serotinus, *Schreb.*.	...	×	...	×	×	×	×	...	...	...	...	...	...	...	10
10	Vesperugo nasutus, *Dobs.* ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
11	Vesperugo abramus, *Dobs.* ...	×	×	×	×	×	×	×	...	...	×	×	×	×	×	12
12	Vesperugo kuhlii, *Blas.*	×	×	×	×	×	×	×	×	...	×	×	×	×	×	12
13	Vesperugo maurus, *Blas.* ...	×	×	×	×	×	×	×	...	...	...	...	...	×	...	13
14	Scotophilus Temminckii, *Gray*	×	...	×	×	×	×	×	×	×	...	×	×	×	×	14
15	Scotophilus Heathii, *Dobs.* ...	...	...	...	×	×	×	×	×	×	×	×	×	×	×	15
16	Scotophilus pallidus, *Dobs.*...	...	...	...	×	...	...	...	...	...	...	...	...	...	...	15
17	Taphozous longimanus, *Hardw.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	17
18	Taphozous saccolæmus, *Tem.*	...	...	...	...	...	...	×	×	...	×	×	...	?	×	17
19	Taphozous Kachensis, *Dobs*...	...	...	...	...	...	...	...	...	...	×	...	...	...	...	18
20	Rhinopoma microphyllum *Wagnèr*.....	...	...	...	×	×	×	×	...	...	×	...	...	×	×	18
21	Sorex cærulescens, *Shaw.* ...	...	...	...	×	×	×	×	×	...	×	×	×	×	×	20
22	Erinaceus pictus, *Stol.*	...	...	...	×	×	?	...	×	×	×	×	...	...	...	22
23	Erinaceus Grayi, *Bennet.* ...	...	...	...	×	×	×	...	×	×	×	...	...	...	...	23
24	Erinaceus Jerdoni, *Anderson.*	...	...	...	×	...	...	...	...	...	...	...	...	...	...	24
25	Tigris regalis, *Gray*	...	×	×	×	×	×	×	×	×	×	×	×	×	×	26
26	Leopardus pardus, *Gray* ...	×	×	×	×	×	×	×	×	×	×	×	×	×	×	27
27	Felis viverrina, *Bennet*	...	...	...	...	...	...	×	...	...	×	...	...	...	...	28
28	Felis ornata, *Gray*	...	...	...	×	...	×	?	...	×	×	×	×	×	...	29
29	Felis chaus, *Guld.*	...	×	...	×	×	×	×	×	×	×	×	×	×	×	29
30	Felis caracal, *Schreb.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	30
31	Gueparda guttata, *Gray*.....	×	×	...	×	×	×	×	×	×	×	×	×	×	×	30
32	Lutra nair, *Cuv.*	...	...	...	×	×	×	×	...	...	×	...	×	×	×	31
33	Mellivora Indica, *Bl.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	32
34	Herpestes griseus, *Desm.* ...	...	...	...	×	×	×	×	×	×	×	×	×	×	×	33
35	Herpestes persicus, *Gray* ...	...	×	...	...	...	...	...	...	...	...	...	...	...	...	33
36	Herpestes ferrugineus, *Blanf.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	33

	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	South India.	Page.
37	Herpestes Andersonii, *Sp. Nov.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	34
38	Canis aureus, *Linn.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	35
39	Canis pallipes, *Sykes*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	36
40	Vulpes Bengalensis *Shaw.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	36
41	Vulpes leucopus, *Blyth.*	...	...	...	×	×	...	...	×	×	×	...	...	...	...	37
42	Vulpes pusillus, *Blyth.*	...	...	...	×	...	...	...	...	...	...	...	...	...	...	37
43	Hyæna striata, *Zim.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	38
44	Ursus tibetanus, *Cuv.*	×	...	...	...	...	...	...	...	...	...	...	...	...	...	39
45	Delphinus plumbeus, *Duss.*	Coast*	...	...	...	...	...	...	...	...	Coast*	...	Coast*	...	...	39
46	Delphinus longirostris, *Gray.*	Coast*	...	...	...	...	...	...	...	...	Coast*	...	Coast*	...	...	40
47	Platanista Indi, *Bly.*	...	...	...	River†	River†	...	River†	...	...	...	...	...	...	...	40
48	Balænoptera Indica, *Blyth.*	Coast*	...	...	...	...	...	...	...	...	Coast*	...	Coast*	...	...	41
49	Sciurus palmarum, *Gmel.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	42
50	Gerbillus indicus, *Hardw.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	42
51	Gerbillus Hurrianæ, *Jerd.*	×	...	×	×	×	...	...	...	×	×	...	...	×	...	43
52	Mus (Nesokia) Hardwickii, *Gray*	×	×	×	×	×	×	...	...	...	...	...	...	...	...	44
53	Mus (Nesokia) Bengalensis, *Gray*	...	...	...	...	×	×	×	×	×	×	...	...	...	...	44
54	Mus (Nesokia) bandicota, *Bechst.*	...	...	...	...	...	...	×	...	×	×	×	×	×	×	45
55	Mus decumanus, *Pall.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	46
56	Mus alexandrinus, *Geoff.*	×	×	...	×	×	×	...	...	...	...	...	...	...	×	46
57	Mus urbanus, *Hodgs.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	46
58	Mus bactrianus, *Blyth.*	×	×	×	×	...	...	...	...	...	...	...	...	...	...	47
59	Mus mettada, *Gray*	...	×	...	...	...	...	...	...	...	...	...	×	×	×	47
60	Hystrix leucura, *Sykes*	×	...	×	×	×	×	...	×	×	×	×	×	×	...	48
61	Lepus craspedotis, *Blanf.*	×	...	...	...	...	...	...	...	...	...	...	...	...	...	49
62	Lepus dayanus, *Blanf.*	×	...	...	...	...	...	...	...	...	...	...	...	...	...	50
63	Lepus Joongshaiensis, *Sp. nov.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	51
64	Equus caballus	...	...	...	...	Throughout India							...	...	...	53
65	Asinus vulgaris, *Gray*	...	...	...	...								...	...	...	53
66	Asinus onager, *Gray*	×	×	...	...	...	...	...	...	...	...	...	...	...	...	54
67	Sus cristatus, *Wagn.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	54
68	Tetracerus quadricornis, *Gray.*	...	...	...	×	...	...	...	...	...	...	...	...	...	×	55
69	Gazella Bennetti, *Sykes.*	×	...	...	×	×	×	×	×	×	×	×	×	×	...	56
70	Capra ægagrus, *Pall.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	56
71	Ovis cycloceros, *Hutton*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	59
72	Hyelaphus porcinus, *Gray*	...	...	...	×	×	×	×	...	...	...	...	...	...	...	60
73	Pholidotus indicus, *Gray*	...	...	...	×	×	×	×	×	×	×	...	...	×	×	60

* Sind, Kutch, Bombay, Malabar, Mekran Coasts. † Rivers Indus, Ganges, Jumna, and Brahmaputra.

BIRDS.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
1	Vultur monachus, *Lin.*	×	×	×	×	×	×	...	×	×	×	×	...	...	...	62
2	Otogyps calvus, *Scop.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	62
3 *bis*	Gyps fulvescens, *Hume*	×	×	×	×	×	×	...	×	×	×	×	...	...	...	63
5	Pseudogyps bengalensis, *Gray*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	63
6	Neophron ginginianus, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	64
7	Gypætus barbatus, *Lin.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	64
8	Falco peregrinus, *Gm.*	×	×	×	×	×	×	×	×	...	×	×	×	×	×	65
10	Falco saker, *Gm.*	×	×	×	×	×	...	×	...	...	×	...	...	...	...	66
11	Falco juggur, *J. E. Gr.*	...	×	×	×	×	×	×	×	×	×	×	×	×	×	67
12	Falco babylonicus, *Gurn.*	×	×	×	×	×	×	...	...	...	...	...	...	...	...	67
12 *bis*	Falco barbarus, *Lin.*	×	×	×	?	...	×	...	...	...	×	...	...	...	...	68
13	Falco subbuteo, *Lin.*	...	×	×	...	...	×	×	...	...	...	×	×	×	...	69
15	Falco æsalon, *Gm.*	×	×	×	×	×	×	...	...	×	...	...	...	...	...	70
16	Falco chiquera, *Daud.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	70
17	Cerchneis tinnuncula, *Boie.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	71
23	Astur badius, *Gm.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	72
24	Accipiter nisus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	73
26	Aquila chrysætos, *Lin.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	74
27	Aquila heliaca, *Savigny.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	74
28	Aquila clanga, *Pall.*	...	×	...	×	×	×	×	×	×	×	×	×	×	×	75
29	Aquila vindhiana, *Frankl.*	...	...	...	×	×	×	×‡	×	×	×	×	×	×	?	76
33	Nisætus fasciatus, *Vieill.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	77
31	Nisætus pennatus, *Gm.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	78
38	Circaetus gallicus, *Gm.*	...	×	...	×	×	×	×	×	×	×	×	×	×	...	79
39	Spilornis cheela, *Lath.*	...	...	...	×	×	×	×	...	×	...	...	×	×	×	80
40	Pandion haliætus, *Lin.*	×	×	...	×	×	×	×	×	×	×	×	×	×	...	81
42	Haliætus leucoryphus, *Pall.*	×	×	×	×	×	×	×	×	...	×	×	×	...	...	82
42 *bis*	Haliætus albicillus, *Lin.*	×	×	...	×	×	×	...	...	...	...	...	...	...	...	83
45	Buteo ferox, *S. G. Gm.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	85
48	Butastur teesa, *Frankl.*	×	S.	...	×	×	×	×	×	...	×	×	×	×	×	86
51	Circus macrurus, *S. G. Gm.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	87
52	Circus cineraceus, *Mont.*	×	×	...	×	×	×	×	×	×	×	...	×	×	...	88
54	Circus æruginosus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	89
55	Haliastur Indus, *Bodd.*	×*	×†	...	×	×	×	×	×	×	×	×	×	×	×	90
56	Milvus govinda, *Sykes*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	90
56 *bis*	Milvus melanotis, *Tem.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	91
59	Elanus cæruleus, *Desf.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	92
60	Strix flammea, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	101
67	Asio otus, *Lin.*	×	×	×	×	×	×	...	...	...	×	...	...	...	...	99
68	Asio accipitrinus, *Pall.*	×	×	×	×	×	×	×	×	×	?	×	×	×	×	100
72	Ketupa ceylonensis, *Gm.*	...	...	...	×	×	×	×	×	×	...	...	×	×	×	92
69	Bubo bengalensis, *Frankl.*	×	...	×	×	×	×	×‡	×	×	×	×	×	×	×	93
70	Bubo coromandus, *Lath.*	...	...	...	×	×	×	×	×	×	...	×	×	×	×	94

* Mekran Coast. † Persian Gulf. ‡ Upper.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
74	Scops pennatus, *Hodgs.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	95
74 *sept.*	Scops brucei, *Hume.*	×	...	×	...	...	...	...	...	...	...	...	×	×	×	95
75 *ter.*	Scops malabaricus, *Jerd.*	...	...	×	×	×	×	×	...	×	...	×	×	×	×	97
76	Carine brama, *Tem.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	99
82	Hirundo rustica, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	102
84	Hirundo filifera, *Steph.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	102
85	Hirundo daurica, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	103
87	Cotyle riparia, *Lin.*	...	×	×	×	×	×	×	?	×	?	×	?	×	...	103
89	Cotyle sinensis, *J. E. Gr.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	103
91 *bis*	Cotyle obsoleta, *Cab.*	×	...	..	...	...	...	...	...	...	×	×	...	..	...	104
98	Cypselus melba, *Lin.*	×	×	×	×	×	×	...	...	×	...	×	×	×	×	104
99 *ter.*	Cypselus apus, *Lin.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	105
100	Cypselus affinis, *J. E. Gr.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	105
111 *bis*	Caprimulgus unwinii, *Hume.*	...	×	×	..	...	...	...	...	...	...	...	...	...	...	105
112	Caprimulgus asiaticus, *Lath.*	...	...	...	...	...	×	...	×	×	×	×	×	×	×	106
113	Caprimulgus mahrattensis, *Sykes*	×	×	×	..	...	...	...	×	×	×	×	×	×	...	107
117	Merops viridis, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	107
118	Merops phillipinus, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	108
120	Merops persicus, *Pall.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	108
121	Merops apiaster, *Lin.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	108
123	Coracias indica, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	109
125	Coracias garrula, *Lin.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	109
129	Halcyon smyrnensis, *Lin.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	110
134	Alcedo bengalensis, *Gm.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	111
134 *bis*	Alcedo ispida, *Lin.*	×	×	×	...	...	...	...	?	...	?	×	...	...	...	111
136	Ceryle rudis, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	112
148	Palæornis torquatus, *Bodd.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	112
158	Picus scindianus, *Gould.*	×	...	×	×	×	...	...	...	...	...	...	...	...	...	113
160	Picus mahrattensis, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	114
182	Brachypternus aurantias, *Bly.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	114
188	Yunx torquilla, *Lin.*	...	...	×	×	×	×	×	×	×	×	×	×	×	×	115
197	Xantholæma hæmacephala, *P. L. S. Mull.*	...	×	...	×	×	×	×	×	×	×	×	×	×	×	116
199	Cuculus canorus, *Lin.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	116
212	Coccystes jacobinus, *Bodd.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	117
214	Eudynamys honorata, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	117
217 *quat.*	Centropus maximus, *Hume*	...	...	...	×	×	×	...	×	×	×	×	×	×	×	118
220	Taccocua sirkee, *Gray*	...	...	...	×	×	×	×	?	×	×	?	×	×	...	118
234	Cinnyris asiatica, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	119
254	Upupa epops, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	120
256	Lanius lahtora, *Sykes.*	×	×	×	×	×	×	×*	×	×	×	×	×	×	...	120
257	Lanius erythronotous, *Vig.*	×	...	×	×	×	×	×	×	×	×	×	×	×	...	121
260	Lanius vittatus, *Valenc.*	×	...	×	×	×	×	×*	×	×	×	×	×	×	×	121
261	Lanius cristatus, *Lin.*	...	...	...	...	...	×	×	×	×	×	×	×	×	×	122
262	Lanius isabellinus, *Hemp.*	×	×	×	×	×	×	×	×	...	×	×	...	...	...	122

Upper.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
265	Tephrodornis pondiceriana, *Gm.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	123
269 *quat.*	Hypocolius ampelinus, *Bp.*	...	×	...	...	...	...	...	...	...	...	...	...	...	...	123
270	Graucalus macii, *Less.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	124
273	Pericrocotus brevirostris, *Vig.*	...	...	...	×	×	×	×	×	×	×	×	...	×	...	125
276	Pericrocotus peregrinus, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	125
278	Buchanga atra, *Herm*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	126
288	Terpsiphone paradisi, *Lin.*	...	...	×	×	×	×	×	×	×	×	×	×	×	×	127
292	Rhipidura albifrontata, *Frankl.*	...	...	...	×	×	×	...	×	×	×	×	×	×	×	129
299 *bis*	Muscicapa grisola, *Lin.*	×	×	×	...	...	...	...	×	...	×	×	...	...	...	127
323 *bis*	Muscicapa parva, *Bechst.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	128
351	Monticola cyanus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	129
353	Monticola cinclorhynchus, *Vig.*	...	...	...	×	×	×	×	×	×	?	×	×	×	×	130
356	Merula unicolor, *Tick.*	...	...	...	×	×	×	×	×	×	...	×	×	×	...	131
365	Merula atrigularis, *Tem.*	×	×	×	×	×	...	×	...	...	...	...	...	...	...	131
385	Pyctorhis sinensis, *Gm.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	132
386 *bis*	Pyctorhis griseigularis, *Hume*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	132
432	Malacocircus terricolor, *Hodgs.*	...	...	...	×	×	×	×	×	×	×	×	...	...	...	133
436	Malacocircus malcolmi, *Sykes*	...	...	...	×	×	×	...	×	×	×	×	×	×	×	133
438	Chatarrhea caudata, *Dum.*	×	×	×	×	×	×	×	×	×	×	×	...	×	×	133
439	Chatarrhea earlii, *Bly.*	...	...	×	×	×	...	×	...	...	...	...	...	...	...	134
443	Laticilla burnesii, *Bly.*	...	...	...	×	×	...	×	...	...	...	...	...	...	...	134
459	Pycnonotus leucotis, *Gould*	×	×	×	×	×	...	...	×	...	×	×	×	×	×	135
462	Pycnonotus hæmorrhous, *Gm.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	135
470	Oriolus kundoo, *Sykes.*	...	...	×	×	×	×	...	×	×	×	×	×	×	×	137
470 *bis*	Oriolus galbula, *Lin.*	...	×	...	...	...	...	...	...	...	...	...	...	...	...	136
475	Copsychus saularis, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	137
480	Thamnobia cambaiensis, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	...	...	...	138
481	Pratincola caprata, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	141
483	Pratincola indica, *Bly.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	139
484	Pratincola leucura, *Bly.*	...	...	...	×	×	...	...	...	...	...	...	...	...	...	140
485 *bis*	Pratincola macrorhyncha, *Stol.*	×	...	×	×	×	...	...	×	...	×	×	...	...	...	138
488	Saxicola opistholeuca, *Strickl.*	×	...	×	×	×	×	...	×	×	×	×	...	...	...	144
489	Saxicola picata, *Bly.*	×	×	×	×	×	×	...	×	×	×	×	...	...	...	142
489 *bis*	Saxicola albonigra, *Hume.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	142
490	Saxicola morio, *Hemp.*	...	×	×	...	...	...	...	...	...	...	...	...	...	...	143
490 *bis*	Saxicola monacha, *Rupp.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	143
490 *ter.*	Saxicola capistrata, *Gould.*	...	×	×	×	×	...	...	...	×	...	...	...	...	...	142
491	Saxicola isabellina, *Cretzsch.*	×	×	×	×	×	×	...	×	×	×	×	...	×	...	146
491 *bis*	Saxicola chrysopygia, *De F.*	×	×	×	×	×	...	...	×	...	×	×	...	...	...	145
492	Saxicola deserti, *Rupp.*	×	×	×	×	×	×	...	×	×	×	×	×	×	...	144
497	Ruticilla rufiventris	×	×	×	×	×	×	×	×	×	×	×	×	×	×	146
514	Cyanecula suecica, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	147
515	Acrocephalus stentoreus, *Hemp.*	×	×	×	...	...	×	×	×	×	?	×	×	×	...	148
516	Acrocephalus dumetorum, *Bly.*	...	...	...	×	×	×	×	...	×	...	×	×	×	×	148
517	Acrocephalus agricola, *Jerd.*	×	...	×	×	×	×	×	...	×	...	...	×	...	×	149
517 *bis*	Lusciniola neglectus, *Hume.*	×	×	...	×	×	...	...	...	...	...	...	...	...	...	150
518 *bis*	Lusciniola melanopogon, *Tem.*	×	×	×	×	×	×	...	...	...	...	...	...	...	...	149

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
518 *ter.*	Cettia cetti, *Marm.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	151
530	Orthotomus sutorius, *Forst.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	151
532	Prinia flaviventris, *Deless.*	...	...	...	...	...	...	×	...	...	...	...	...	...	...	152
539	Cisticola cursitans, *Frankl.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	152
544	Drymoipus inornata, *Sykes.*	...	...	...	×	×	×	×	×	×	×	×	...	×	...	153
549*quint.*	Blanfordius striatulus, *Hume.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	153
550	Burnesia gracilis, *Licht.*	×	×	×	×	×	×	×	×	×	×	×	...	×	...	154
550 *bis*	Scotocerca inquieta, *Rupp.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	154
551	Franklinia buchanani, *Bly.*	...	...	...	×	×	×	...	×	×	×	×	...	×	×	155
	Hypolais pallida, *Hemp and Ehr.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	156
553	Hypolais rama, *Sykes.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	157
553 *bis*	Hypolais caligata, *Licht.*	×	×	...	×	×	×	...	...	×	...	×	×	×	×	158
	Hypolais obsoleta, *Severtz.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	158
554	Phylloscopus tristis, *Bly.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	159
554 *ter.*	Phylloscopus sindianus, *Brooks.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	160
559	Phylloscopus nitidus, *Bly.*	...	...	×	×	×	×	×	...	×	...	...	×	×	×	159
563	Reguloides occipitalis, *Jerd.*	...	...	...	×	×	×	×	...	×	...	...	×	×	×	160
581	Sylvia jerdoni, *Bly.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	161
582 *bis*	Sylvia minuscula, *Hume.*	×	...	×	×	×	...	...	×	...	×	×	...	...	...	161
582	Sylvia affinis, *Bly.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	161
582 *ter.*	Sylvia althea, *Hume*	...	...	...	×	×	×	...	...	×	...	×	×	×	...	162
582 *quat.*	Sylvia cinerea, *Bechst.*	...	×	...	×	×	...	×	×	...	...	...	...	...	×	162
583 *bis*	Sylvia nana, *Hemp.*	×	×	...	×	×	...	...	×	...	...	...	...	...	...	163
492 *ter.*	Sylvia familiaris, *Ménétr.*	×	×	×	...	...	...	...	×	...	×	×	...	...	...	163
589	Motacilla madraspatana, *Bris.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	164
591	Motacilla personata, *Gould.*	×	×	×	×	×	×	×	×	...	×	×	×	×	...	165
591 *bis*	Motacilla alba, *Sykes.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	166
592	Calobates boarula, *Penn.*	...	×	×	×	×	×	×	×	×	×	×	×	×	×	166
593	Budytes cinereocapilla, *Savi.*	...	×	×	×	×	×	×	...	×	...	...	×	×	...	167
593 *bis*	Budytes melanocephala, *Licht.*	×	×	×	×	×	...	×	×	×	×	×	×	×	...	168
593 *ter.*	Budytes flava, *Lin.*	?	×	×	×	×	×	×	...	...	...	×	?	?	...	168
594	Budytes calcaratus, *Hodgs.*	...	×	×	×	...	×	...	×	×	×	×	×	×	...	169
594 *bis*	Budytes citreola, *Pall.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	169
597	Anthus arboreus, *Bechst.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	170
600	Corydalla rufulus, *Viell.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	172
602	Agrodroma campestris, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	173
604	Agrodroma sordidus, *Rupp.*	×	×	×	×	×	×	...	...	×	...	×	...	×	...	173
605 *ter.*	Anthus spinoletta, *Lin.*	×	×	×	×	×	...	...	...	...	...	×	...	...	...	170
605 *quat.*	Anthus blackistonii, *Swinh.*	...	...	×	×	×	...	...	...	...	...	...	...	...	...	171
631	Zosterops palpebrosus, *Tem.*	...	...	...	×	×	×	...	×	×	...	×	×	×	×	174
657 *bis*	Corvus lawrencei, *Hume*	×	...	×	×	×	...	...	×	...	×	...	...	...	...	175
660 *bis*	Corvus umbrinus, *Hedenb.*	×*	×	×	×	...	...	...	...	...	...	...	...	...	...	175
663	Corvus splendens, *Viell.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	176
	Garrulus atricapillus, *Geoff.*	...	×	...	...	...	...	...	...	...	...	...	...	...	...	176
674	Dendrocitta rufa, *Scop.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	177

* Mekran Coast.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
681	Sturnus vulgaris, *Lin.*	×	×	×	×	×	×	...	×	×	×	×	...	...	...	178
681 *bis*	Sturnus minor, *Hume*	...	...	...	×	×	...	...	...	...	...	...	...	...	...	178
684	Acridotheris tristis, *Lin.*	×	...	...	×	×	×	×	×	×	×	×	×	×	×	178
685	Acridotheris ginginianus, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	179
687	Temenuchus pagodarum, *Gm.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	179
690	Pastor roseus, *Lin.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	180
694	Ploceus phillipinus, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	180
695	Ploceus manyar, *Horsf.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	181
696	Ploceus bengalensis, *Lin.*	...	...	...	...	...	...	×	...	...	...	×	...	...	...	181
703	Munia malabarica, *Lin.*	×	...	...	×	×	×	×	×	×	×	×	×	×	×	182
704	Estrelda amandava, *Lin.*	...	...	...	×	×	×	×	...	×	...	×	×	×	×	182
706	Passer indicus, *Jard. and Selby.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	183
707	Passer salicicola, *Viell.*	×	×	×	×	×	...	...	×	...	...	...	...	...	...	183
709	Passer pyrrhonotus, *Bly.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	184
711	Passer flavicollis, *Frankl.*	×	×	...	×	×	×	...	×	×	×	×	×	×	×	184
716	Emberiza huttoni, *Bly.*	×	×	×	×	...	×	...	×	×	×	×	×	×	...	185
718	Emberiza stewarti, *Bly.*	×	...	×	×	×	...	...	×	...	...	...	...	...	...	185
720 *bis*	Emberiza striolata, *Licht.*	×	...	...	×	×	...	...	×	...	×	×	...	...	...	186
721	Euspiza melanocephala, *Scop.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	188
722	Euspiza luteola, *Sparrm.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	188
724	Melophus melanicterus, *Gm.*	...	...	...	×	×	×	...	×	×	×	×	×	×	...	189
732 *bis*	Bucanetes githagineus, *Licht.*	×	×	×	×	...	...	...	×	...	×	...	...	...	...	190
738	Carpodacus erythrinus, *Pall.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	189
	Serinus pectoralis, *Sp. Nov.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	190
756	Mirafra erythroptera, *Jerd.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	192
759	Ammomanes lusitania, *Gm.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	192
760	Pyrrhulauda grisea, *Scop.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	193
760 *bis*	Pyrrhulauda melanauchen, *Cab.*	×	×	...	...	...	...	...	×	...	×	×	...	...	...	193
761	Calendrella brachydactyla, *Leisl.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	193
761 *ter.*	Melanocorypha bimaculata, *Menetr.*	×	×	×	...	...	...	...	?	...	...	...	...	...	...	195
762 *ter.*	Alaudula adamsi, *Hume*	...	...	...	×	×	×	...	...	...	...	...	...	...	...	196
767	Alauda gulgula, *Frankl.*	×	?	...	×	×	×	×	×	×	×	×	×	×	×	197
769	Galerida cristata, *Lin.*	×	×	×	×	×	×	...	×	...	×	×	...	×	...	198
770	Certhilauda desertorum, *Stanl.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	199
772	Crocopus chlorigaster, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	..	200
784	Palumbus casiotis, *Bp.*	×	×	×	×	×	...	...	...	...	...	...	...	...	...	201
787	Palumbæna eversmanni, *Bp.*	...	...	...	×	...	×	...	...	...	...	...	...	...	...	201
788	Columba intermedia, *Strickl.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	202
	Columba intermedia, *var* atra.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	202
788 *bis*	Columba livia, *Bp.*	×	×	×	...	...	...	×	...	...	...	...	...	...	...	202
794	Turtur senegalensis, *Lin.*	×	×	×	×	×	×	...	×	×	×	×	×	×	×	203
795	Turtur suratensis, *Gm.*	...	...	×	×	×	×	×	×	×	×	×	×	×	×	203
796	Turtur risoria, *Lin.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	204
797 *bis*	Turtur humilis, *Tem.*	×	...	...	×	×	×	×	×	...	×	×	×	×	...	204
799	Pterocles arenarius, *Pall.*	×	×	×	×	×	×	×	×	...	×	×	...	...	...	209
800 *bis*	Pterocles lichtensteinii, *Tem.*	×	...	...	×	...	...	...	...	...	...	...	...	...	...	212

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
801	Pterocles alchata, *Lin.*	×	×	×	×	×			×							210
801 *bis*	Pterocles senegallus, *Lin.*	×			×				×		×	×				207
801 *ter.*	Pterocles coronatus, *Licht.*	×	×	×												206
802	Pterocles exustus, *Tem.*	×		×	×	×	×	×	×	×	×	×	×	×		210
803	Pavo cristatus, *Lin.*				×	×	×		×	×	×	×	×	×	×	212
818	Francolinus vulgaris, *Steph.*	×	×	×	×	×	×	×	×	×	×	×				213
820	Caccabis chukor, *J. E. Gr.*	×	×	×	×	×										213
821	Ammoperdix bonhami, *G. R. Gr.*	×	×	×	×	×										214
822	Ortygornis pondiceriana, *Gm.*	×	×		×	×	×	×	×	×	×	×	×	×	×	214
829	Coturnix communis, *Bonn.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	215
830	Coturnix coromandelica, *Gm.*	×	×		×	×	×	×	×	×	×	×	×	×	×	215
834	Turnix joudera, *Hodgs.*				×	×	×	×	×	×	×	×		×	×	216
835	Turnix dussumieri, *Tem.*				×	×	×	×	×	×	×	×	×	×		217
836	Eupodotis edwardsi, *J. E. Gr.*				×	×	×		×	×	×	×	?	×		217
837	Houbara macqueenii, *J. E. Gr.*	×	×	×	×	×			×	×	×	×		×		218
839	Sypheotides auritus, *Lath.*				×	×	×	×	×	×	×	×	×	×	×	220
840	Cursorius coromandelicus, *Gm.*				×	×	×	×*	×		×	×	×	×	×	221
840 *bis*	Cursorius gallicus, *Gm.*	×	×	×	×	×	×		×		×	×				221
842	Glareola orientalis, *Leach.*						×	×		×				×		222
842 *bis*	Glareola pratincola, *Lin.*		×	×									×			223
843	Glareola lactea, *Tem.*				×	×	×	×						×		223
844	Squatarola helvetica, *Lin.*	×						×	×		×	×	×		×	224
845	Charadrius longipes, *Tem.*				×		×	×	×	×	×	×	×	×	×	224
845 *bis*	Charadrius pluvialis, *Lin.*	×														225
846	Ægialitis geoffroyi, *Wagl.*	×	×					×	×		×	×	×		×	226
847	Ægialitis pyrrhothorax, *Tem.*	×	×	×				×	×		×	×	×		×	226
848	Ægialitis cantiana, *Lath.*	×	×	×	×	×	×	×	×		×	×	×		×	226
849	Ægialitis phillipinus, *Lath.*	×	×	×	×	×	×	×	×		×	×	×	×	×	227
851	Vanellus cristatus, *Bechst.*	×	×	×	×	×										228
852	Chettusia gregaria, *Pall.*	×	×	×	×		×		×	×	×	×	×	×		229
853	Chettusia leucura, *Licht.*	×	×	×	×	×	×	×	×	×	×	×				229
855	Lobivanellus indicus, *Bodd.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	229
856	Sarciophorus bilobus, *Gmel.*				×	×	×	×	×	×	×	×	×	×	×	230
857	Hoplopterus ventralis, *Cuv.*				×	×	×	×		×						231
858	Æsacus recurvirostris, *Cuv.*				×	×	×	×	×	×	×	×		×	×	231
859	Œdicnemus crepitans, *Tem.*		×		×	×	×	×	×	×	×	×		×	×	232
860	Strepsilas interpres, *Lin.*	×	×					×	×		×			×	×	233
861	Dromas ardeola, *Payk.*	×	×								×	×				234
862	Hæmatopus ostralegus, *Lin.*	×	×									×				235
863	Grus antigone, *Lin.*				×	×	×	×	×	×	×	×	×	×		235
864	Grus leucogeranus, *Pall.*			×	×	×	×									236
865	Grus cinerea, *Bechst.*	×	×	×	×	×	×	×	×	×	×	×	×	×		237
866	Anthropoides virgo, *Lin.*	×		×	×	×	×	×	×	×	×	×	×	×	×	237
867	Scolopax rusticola, *Lin.*	×	×	×				×				×	×		×	238
870	Gallinago sthenura, *Kuhl.*				×	×	×	×	×	×	×	×	×	×	×	239

* Upper.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N.W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
871	Gallinago scolopacina, *Bp.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	240
872	Gallinago gallinula, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	241
873	Rhynchæa bengalensis, *Lin.*	×	...	×	×	×	×	×	×	×	×	×	×	×	×	242
875	Limosa ægocephala, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	...	...	...	243
875 *bis*	Limosa lapponica, *Lin.*	×*	×	...	...	...	...	...	...	...	...	...	...	...	...	244
876	Terekia cinerea, *Guld.*	×	×	...	...	...	...	×	...	...	×	×	...	...	×	246
877	Numenius arquata, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	...	×	247
878	Numenius phæopus, *Lin.*	×	×	...	×	×	×	×	...	...	×	×	×	...	×	247
880	Philomachus pugnax, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	248
881 *bis*	Tringa crassirostris, *Tem.*	×	...	...	...	...	...	...	...	...	...	...	...	...	...	249
882	Tringa subarquata, *Guld.*	×	×	×	×	×	×	×	×	×	×	?	×	×	?	250
883	Tringa cinclus, *Lin.*	...	...	...	×	×	×	×	...	...	×	×	...	...	...	251
884	Tringa minuta, *Leisl.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	251
885	Tringa Temmincki, *Leisl.*	...	...	×	×	×	×	×	×	×	×	...	...	...	...	251
886	Limicola platyrhyncha, *Tem.*	×	...	...	...	...	...	×	...	...	×	...	×	...	...	252
888	Calidris arenaria, *Lin.*	×	×	...	...	...	...	...	...	...	×	×	×	...	×	252
890	Phalaropus hyperboreus, *Lin.*	×	×	×	...	...	...	...	...	...	...	...	...	...	...	253
891	Actitis glareola, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	253
892	Actitis ochropus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	254
893	Actitis hypoleucus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	254
894	Totanus glottis, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	254
895	Totanus stagnatilis, *Bechst.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	255
896	Totanus fuscus, *Jerd.*	×	×	...	×	×	×	×	×	...	×	×	...	...	...	255
897	Totanus calidris, *Lin.*	×	×	×	×	×	×	×	×	×	×	...	×	...	...	256
	Totanus, *Sp.*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	256
898	Himantopus intermedius, *Bly.*	×	×	...	×	×	×	×	×	×	×	×	×	×	...	258
899	Recurvirostra avocetta, *Lin.*	×	×	...	...	...	...	×	×	...	×	×	...	...	...	258
901	Hydrophasianus chirurgus, *Scop.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	259
902	Porphyrio poliocephalus, *Lath.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	260
903	Fulica atra, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	261
604	Gallicrex cinereus, *Gm.*	...	...	...	...	...	...	×	...	×	...	...	...	...	×	261
905	Gallinula chloropus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	262
907	Gallinula phœnicura, *Penn.*	...	...	...	×	×	×	×	?	×	×	×	×	×	×	263
909	Porzana maruetta, *Leach.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	264
910	Porzana pygmæa, *Naum.*	×	...	×	×	...	×	×	×	×	×	×	×	×	×	264
910 *bis*	Porzana minuta, *Pall.*	...	...	...	×	?	...	...	?	...	...	...	...	...	...	265
915	Leptoptilus argala, *Lin.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	266
917	Xenorhynchus asiaticus, *Lath.*	...	...	...	×	×	×	×	×	×	×	×	×	×	...	266
918	Ciconia nigra, *Lin.*	...	...	×	×	×	×	×	×	×	×	×	×	×	...	267
919	Ciconia alba, *Bechst.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	267
920	Ciconia leucocephala, *Gm.*	...	...	...	×	×	×	×	...	×	?	×	×	×	×	267
923	Ardea cinerea, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	269
924	Ardea purpurea, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	269
924 *bis*	Herodias alba, *Lin.*	×	×	×	×	×	×	×	×	...	×	×	...	...	...	270
925	Herodias torra, *B. Ham.*	×	×	...	×	×	×	×	×	×	×	×	×	×	...	270

* Mekran Coast.

No. in Jerdon's B. of India.	Species.	Beloochistan.	Persia.	Afghanistan.	Punjab.	N. W. Provinces.	Oudh.	Bengal.	Rajputana.	Central India.	Kutch.	Guzerat.	Concan.	Deccan.	S. India.	Page.
926	Herodias intermedia, *Hass.*	×	×	...	×	×	×	×	×	×	×	×	×	×	...	270
927	Herodias garzetta, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	270
928	Demi-egretta gularis, *Bosc.*	×	×	...	...		...	...	×	...	×	×	×	×	...	271
929	Bubulcus coromanda, *Bodd.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	271
930	Ardeola grayii, *Sykes.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	272
931	Butorides javanica, *Horsf.*	×	×	...	×	×	...	×	×	×	×	×	×	×	×	272
932	Ardetta flavicollis, *Lath.*	...	...	...	...	...	...	×	...	...	...	...	...	...	×	273
933	Ardetta cinnamomea, *Gm.*	...	...	...	×	×	×	×	×	...	×	×	×	...	×	274
934	Ardetta sinensis, *Gm.*	...	...	...	...	...	...	×	...	..	...	×	...	×	...	274
935	Ardetta minuta, *Lin.*	×	×	...	×	...	...	×	...	...	...	...	...	...	...	274
936	Botaurus stellaris, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	275
937	Nycticorax griseus, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	276
938	Tantalus leucocephala, *Gmel.*	×	...	...	×	×	×	×	×	×	×	×	...	×	...	276
939	Platalea leucorodia, *Lin.*	×	×	×	×	×	×	×	×	×	×	×	×	×	...	277
940	Anastomus oscitans, *Bodd.*	×	×	...	×	×	×	×	?	×	?	×	...	×	×	277
941	Threskiornis melanocephalus, *Lath.*	×	×	...	×	×	×	×	×	×	×	×	×	×	...	278
942	Geronticus papillosus, *Tem.*	×	×	...	×	×	×	×	×	×	×	×	×	×	×	278
943	Falcinellus igneus, *S. G. Gm.*	×	×	×	×	×	×	×	×	×	×	×	...	×	...	279
944	Phœnicopterus antiquorum, *Tem.*	×	×	×	×	×	×	×	×	×	×	×	×	×	×	280
944 *bis*	Phœnicopterus minor, *G. St. Hil.*	...	×	...	×	×	...	...	×	×	...	×	...	×	...	281
944 *ter.*	Cygnus olor, *Gm.*	...	×	×	×	...	...	...	...	...	×	...	...	...	...	282
945	Anser cinereus, *Meyer*	...	...	×	×	×	×	×	×	...	×	×	...	...	...	283
947	Anser albifrons, *Scop.*	×	×	×	×	×	×	...	...	...	...	...	...	...	...	284
949	Anser indicus, *Lath.*	...	...	...	×	×	×	×	×	...	×	...	...	...	...	285
950	Sarkidiornis melanonotus, *Penn.*	...	...	...	×	×	×	×	×	...	×	×	×	×	×	286
952	Dendrocygna javanica, *Horsf.*	...	...	...	×	×	×	×	×	×	×	×	×	×	×	287
953	Dendrocygna fulva, *Gm.*	...	...	...	×	×	×	×	×	...	×	×	×	×	×	288
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959	Anas pœkilorhyncha, *Forst.*	×	×	...	×	×	×	×	×	...	×	×	...	×	×	292
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974 *bis*	Podiceps nigricollis, *Sund.*	...	...	...	...	...	...	...	..	..	...	...	...	...	...	311
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* Mekran Coast.

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